WG III contribution to the Sixth Assessment Report
List of corrigenda to be implemented

Document (Chapter, Annex, Supp. Material)	Page (Based on the final pdf FGD version)	Line	Detailed information on correction to make
Chapter 1	Front page	Contributing Authors	Alexandre Koberle is a LA, also listed as CA, needs to be removed from CA list. And CA list needs to be in alphabetical order.
Chapter 2	26	2-3	Replace: Two countries (China, India) contributed more than 50% to the net 6.5 GtCO2eqyr-1 increase in GHG emissions during 2010-2019 (at 39% and 14%, respectively), while ten countries (China, India, Indonesia, Vietnam, Iran, Turkey, Saudi Arabia, Pakistan, Russian Federation, Brazil) jointly contributed about 75% (Figure 2.9) (see also Minx et al., 2021; Crippa et al., 2021). With: Ten countries jointly contributed about 75% of the net 6.5 GtCO2eqyr-1 increase in GHG emissions during 2010-2019, of which two countries contributed more than 50% (Figure 2.9) (see also Minx et al., 2021; Crippa et al., 2021).
Chapter 2	81	1	Replace: AFOLU sector is responsible for 24% of total GHG emissions With: AFOLU sector is responsible for 22% of total GHG emissions
Chapter 2	33	15	Replace: consumption of goods and services within a region as well as for export production are often used by WIth: consumption of goods and services within a region (for both domestic use and export) are often used by
Chapter 2	33	34	Replace: may be significantly different from the country’s current annual emissions (Botzen et al., 2008; Ritchie with: may be different from the country’s current annual emissions (Botzen et al., 2008; Ritchie
Chapter 2	33	43	Replace: emission accounting (IBE), which traces emissions throughout all supply chains and allocates emissions With: emission (IBE) accounting, which traces emissions throughout all supply chains and allocates emissions

Chapter 2	34	36	Replace: analysis (Wiedmann and Lenzen, 2018), with other methods playing a minor role, e.g. analysing With: analysis (Wiedmann and Lenzen, 2018). Other frequently used approaches include analysing
Chapter 2	39	4	Replace: the decoupling of PBE until 2018. The latest PBE data of 2019 may not change the key messages. With: the decoupling of PBEs until 2018.
Chapter 2	63	16	Replace: Pereira et al., 2016), for Latin American countries (Zhong et al., 2020). With: Pereira et al., 2016), and Latin American countries (Zhong et al., 2020).
Chapter 2	63	27	Replace: household emissions (Long et al., 2017). An overview investigation of Japan's household emissions With: household emissions (Long et al., 2017). An investigation of Japan's household emissions
Chapter 2	64	18	Replace: day) are responsible for 36% to 45% of GHG emissions, while those in the bottom 50% (income less With: day) are responsible for 34% to 45% of GHG emissions, while those in the bottom 50% (income less
Chapter 2	64	20	Replace: study (Chancel and Piketty, 2015; Semieniuk and Yakovenko, 2020; Hubacek et al., 2017b) (Figure With: study (Chancel and Piketty, 2015; Hubacek et al., 2017b) (Figure
Chapter 2	64	23	Replace: analysed the impact of household consumption across different income households on the whole CO2 With: analysed the impact of household consumption across different income households on CO2
Chapter 2	65	27	Replace: residents in outlying suburbs, which show a large range of household emissions (from -50% to +60%) With: residents in suburbs, which show a large range of household emissions (from -50% to +60%)

Chapter 2	65	28	Replace: (Kahn, 2000; Jones and Kammen, 2014). From a global average perspective, higher population density With: (Kahn, 2000; Jones and Kammen, 2014). Higher population density
Chapter 2	65	29	Replace: is associated with lower per capita emissions (Liddle and Lung, 2014; Liu et al., 2017). With: tends to be associated with lower per capita emissions (Liddle and Lung, 2014; Liu et al., 2017).
Chapter 2	65	30	Replace: Location choices are a significant contributor to household emissions. Suburbanites generally purchase With: Location choices are a significant contributor to household emissions. Suburbanites tend to own larger
Chapter 2	52	1	Figure 2.2.1 panel c table is missing a row. Currently the table in panel c has 10 rows, it should have 11. The row for "world" is missing. This was due to a coding error. The missing values are (from left to right); +0.7%, +0.6%, -2.2%, +1.3%, +1.2%. We will provide an updated figure to correct the mistake.
Chapter 2	53	3	Replace: In all regions, the amount of land required per unit of agricultural output has decreased significantly from 2010 to 2019, with a global average of -2.5% yr-1 (land efficiency metric in Figure 2.21). With: In all regions, the amount of land required per unit of agricultural output has decreased significantly from 2010 to 2019, with a global average of -2.2% yr-1 (land efficiency metric in Figure 2.21).
Chapter 2	21	1	Some values shown in Figure 2.5 are wrong Total emissions in 2019 (panel a) are 59GtCO2. Total emissions in 2019 using different gwp100 metric values (panel b) are (from left to right: 59, 62, 59, 57). The fraction of emissions for each gas should be (top to bottom): 1, 5, 21, 13, 59 (1990); 2, 5, 20, 12, 61 (2000); 2, 5, 18, 10, 65 (2010); 2, 4, 18, 11, 64 (2019). Replace with FGD SPM figure.
Chapter 2	4	6	Replace: Average annual GHG emissions were 56 GtCO2eqyr-1 for... With: Average annual GHG emissions were 56 ± 6.0 GtCO2eqyr-1 for...
Chapter 2	22	5	Replace - but rebounded by the end of 2020 With: - but rebounded by the end of 2020 (medium confidence)

Chapter 2	7	24	Replace: 880 (640-1160) With: 890 (640-1160)
Chapter 2	21	10	Replace: CO_2-AFOLU; With: CO_2-LULUCF
Chapter 2	24	3	insert Cross reference to the cross-chapter scenario box in chapter 1
Chapter 2	72	6	Replace: Medium confidence With: high confidence
Chapter 2 and TS	31	3	Replace: 5.6% WIth: 6%
Chapter 2	5	44	Replace: the relative shares of industry and buildings emissions rise to 34% and 17%, respectively With: the relative shares of industry and buildings emissions rise to 34% and 16%, respectively.
Chapter 2	Front	8	Xianchun C. Tan
Chapter 2	4	8	Replace: {2.2.2, Table 2.1, Figure 2.5} With: {2.2.2, Table 2.1, Figure 2.2, Figure 2.5}
Chapter 2	30	28	Replace: Ranking of high emitting sectors by direct emissions highlights the importance of the LULUCF CO_2 (6.6 $GtCO_2eq$), road transport (6.1 $GtCO_2eq$), metals (3.1 $GtCO_2eq$), and other industry (4.4 $GtCO_2eq$) sub-sectors WIth: Ranking of high emitting sectors by direct emissions highlights the importance of CO_2 emissions from LULUCF (6.6 $GtCO_2eq$; but with low confidence in magnitude and trend), road transport (6.1 $GtCO_2eq$), metals (3.1 $GtCO_2eq$), and other industry (4.4 $GtCO_2eq$) sub-sectors.
Chapter 2	54	12	Replace: carbon emissions With: GHG emissions
Chapter 3	93	Fig 1, CWG Box 1	Missing figure (legend is present). CWG Box to also be added to chapter ToC

Chapter 3	88	41-43	Replace: Equitable burden sharing compliant with the Paris Agreement leads to negative carbon allowances for developed countries as well as China by mid-century (van den Berg et al. 2020), more stringent than cost-optimal pathways With: Some interpretations of equitable burden sharing compliant with the Paris Agreement leads to negative carbon allowances for developed countries and some developing countries by mid-century (van den Berg et al. 2020), more stringent than cost-optimal pathways
Chapter 3	6	42	Replace: around 199 (56-482) million ha in 2100 in pathways With: around 199 (56-482) million ha in 2050 in pathways
Chapter 3	6	4	Replace: it is achieved around 10-20 years later than With: it is achieved around 10-40 years later than
Chapter 3	26	52	Replace: it is achieved around 10-20 years later than With: it is achieved around 10-40 years later than
Chapter 3	Front	10	Replace: Detlef van Vuuren With: Detlef P. van Vuuren
Chapter 3	Front	8	Replace: Glen Peters With: Glen P. Peters
Chapter 3	53	1	Replace: "Table 3.4: Energy, emissions and CDR characteristics of the pathways by climate category for 2030, 2050, 2100. Source: AR6 scenarios database" With: "Table 3.4: Energy and emissions characteristics of the pathways by climate category for 2030, 2050, 2100. Source: AR6 scenarios database"

Chapter 3	53	2	Table 3.4 A new version will be updated with the following changes: 1. Change SSP2-2.6 to SSP1-2.6 in row C3, column 1, sub column 3 2. Title of third tow to be changed from: "Co2 intensity of Primary Energy Index 2020 = 100" to "Energy & Industrial Processes variable 2020 = 100" 3. Total CDR column to be removed altogether
Chapter 3	53	2	Table 3.4 Old Fotnotes 0-2 updated inresponse to Gov comments in the SPM Table 1.
Chapter 3	17	17	Table 3.1 Change SSP2-2.6 to SSP1-2.6
Chapter 3	17	17	Table 3.1 Change header column "WGIII IP" to "WGIII IP/IMP"
Chapter 3	55	19	Fig 3.21 (left panel) –updated Should be the same as SPM Fig 5 lower right panel
Chapter 3	67	27	Table 3.5 Total CDR row of the table should no longer be included (delete) Additionally, add footnote: ""Cumulative CDR from AFOLU cannot be quantified precisely because models use different reporting methodologies that in some cases combine gross emissions and removals, and use different baselines."
Chapter 3	82	1	Fig 3.31 - updated A new figure to replace existing one
Chapter 3	43	4	are associated with net global GHG emissions of 40 (32–55) GtCO2-eq yr-1 by 2030 and 20 (13-26) change to: are associated with net global GHG emissions of 44 (32–55) GtCO2-eq yr-1 by 2030 and 20 (13-26)
Chapter 3	48	1	Fig 3.16 - updated A new figure to replace existing one
Chapter 3	22	1	Fig 3.6 - updated A new figure to replace existing one
Chapter 3	23	2	Fig 3.7 - updated A new figure to replace existing one
Chapter 3	28	1	Fig 3.10 - updated A new figure to replace existing one
Chapter 3	42	30	Fig 3.14 - updated A new figure to replace existing one
Chapter 3	75	23	Table 3.6 – updated A new figure to replace existing one
Chapter 3	4	16	2.4°C change to: 2.2°C

Chapter 3	4	15	52-60 GtCO2-eq yr-1 by 2030 and to 46-67 change to 54-61 GtCO2-eq yr-1 by 2030 and to 47-67
Chapter 3	73	19-22	Replace with: To still have a likely chance to stay below 2°C, the global post-2030 GHG emission reduction rates would need to be abruptly raised in 2030 from 0-0.7 GtCO2-eq yr-1 to an average of 1.4-2.0 GtCO2-eq yr-1 during the period 2030-2050 (Figure 3.30c), around 70% of that in immediate mitigation pathways confirming findings in the literature (Winning et al. 2019).
Chapter 3	69	1	Replace: reductions would need to abruptly increase after 2030 to an annual average rate of 1.3-2.1 GtCO2-eq during the period 2030-2050, With: reductions would need to abruptly increase after 2030 to an annual average rate of 1.4-2.0 GtCO2-eq during the period 2030-2050,
Chapter 3	72	25-28	Replace: For the 139 scenarios of this kind that are collected in the AR6 scenario database and that still likely limit warming to 2°C, the 2030 emissions range is 52.5 (46.5-56) GtCO2-eq (based on native model reporting) and 52.5 (47-56.5) GtCO2-eq, respectively (based on harmonized emissions data for climate assessment) With: For the 139 scenarios of this kind that are collected in the AR6 scenario database and that still likely limit warming to 2°C, the 2030 emissions range is 53 (45-58) GtCO2-eq (based on native model reporting) and 52.5 (47-56.5) GtCO2-eq, respectively (based on harmonized emissions data for climate assessment)
Chapter 3	72	32-25	Replace: The assessed emission ranges from implementing the unconditional (unconditional and conditional) elements of current NDCs implies an emissions gap to cost-effective mitigation pathways of 20-26 (16-24) GtCO2-eq in 2030 for limiting warming to 1.5°C with no or limited overshoot and 10-17 (7-14) GtCO2-eq in 2030 for likely limiting warming to 2°C With: The assessed emission ranges from implementing the unconditional (unconditional and conditional) elements of current NDCs implies an emissions gap to cost-effective mitigation pathways of 19-26 (16-23) GtCO2-eq in 2030 for limiting warming to 1.5°C with no or limited overshoot and 10-16 (6-14) GtCO2-eq in 2030 for likely limiting warming to 2°C
Chapter 3	82	1	Figure 3.31 Change title to "GHG emissions"

Chapter 3	75	23	Table 3.6 – Definition of global indicators in the rows need to be clarified: Change in GHG emissions in ... Change in CO2 emissions in ... Change in net land use CO2 emissions in ... Change in CH4 emissons in ... Change in primary energy from coal ... Change in primary energy from oil ... Change in primary energy from gas ... Change in primary energy from nuclear ... Change in primary energy from modern biomass ... Change in primary energy from coal ... Change in carbon intensity of electricity in ... Change in carbon intensity of non-electric final energy consumption in ...
Chapter 3	4	35	with net global GHG emissions of 30-49 GtCO2-eq yr-1 by 2030 and 13-27 GtCO2 change to with net global GHG emissions of 32-55 GtCO2-eq yr-1 by 2030 and 14-26 GtCO2
Chapter 3	4	36-37	This corresponds to reductions, relative to 2019 levels, of 12-46% by 2030 and 52-77% by 2050. change to This corresponds to reductions, relative to 2019 levels, of 13-45% by 2030 and 52-76% by 2050.
Chapter 3	4	40	reductions of 38–63% by 2030 and 75-98% by 2050 relative to 2019 levels. change to reductions of 34–60% by 2030 and 73-98% by 2050 relative to 2019 levels.
Chapter 3	5	32	890 (640-1160) GtCO2 in pathways likely limiting warming to 2.0°C. change to 880 (640-1130) GtCO2 in pathways likely limiting warming to 2.0°C.
Chapter 3	5	37	4-11 GtCO2-eq yr-1 change to 8 (4-12)
Chapter 3	5	6	Replace: to an average of 1.3-2.1 GtCO2-eq per year With to an average of 1.4-2.0 GtCO2-eq per year
Chapter 3	43	9	and 84 (74–98) % in 2050 change to and 84 (73–98) % in 2050
Chapter 3	37	21	net zero around 2060-2100 change to net zero around 2055-2095

Chapter 3	37	24	4-11 GtCO2-eq yr-1 change to 4-12 GtCO2-eq yr-1
Chapter 3	26	36	to 52-60 GtCO2-eq yr-1 by 2030 and to 46-67 change to to 54-60 GtCO2-eq yr-1 by 2030 and to 47-67
Chapter 3	26	38	to a median global warming of 2.4°C to 3.5°C by 2100 change to to a median global warming of 2.2°C to 3.5°C by 2100
Chapter 3	29	14	While warming would likely be in the range from 2.2-3.8 °C – warming above 5°C cannot be excluded. change to While warming would more likely than not be in the range from 2.2-3.5 °C – warming up to 5°C cannot be excluded.
Chapter 3	29	6-7	(caption) Global mean temperature outcome of the ensemble of scenarios included in the climate categories C1-C7 (based on RCM calibrated to the WGI assessment, both in terms of future and historic warming). The left panel shows the ranges of scenario uncertainty (shaded area) with the P50 RCM probability (line). The right panel shows the P5 to P95 range of RCM climate uncertainty (C1-C7 is explained in Table 3.1) and the P50 (line) and P66 (dashed line). change to Global mean temperature outcome of the ensemble of scenarios included in the climate categories C1-C8 (based on RCM calibrated to the WGI assessment, both in terms of future and historic warming). The left panel shows the ranges of scenario uncertainty (shaded area) with the P50 RCM probability (line). The right panel shows the P5 to P95 range of combined RCM climate uncertainty (C1-C8 is explained in Table 3.1) and scenario uncertainty, and the P50 (line) ~~and P66 (dashed line)~~.
Chapter 3	29	25	combining scenario and uncertainty change to combining scenario and climate uncertainty
Chapter 3	81	4	Replace: GHG emissions of 47 (38-51) With: global GHG emissions of 48 (38-52)
Chapter 3	5	12-14	Replace: Pathways accelerating actions compared to current NDCs that reduce annual GHG emissions to 47 (38-51) GtCO2-eq by 2030, or 3-9 GtCO2-eq below projected emissions from fully implementing current NDCs reduce the mitigation challenge for likely limiting warming to 2°C after 2030. WIth: Pathways accelerating actions compared to NDCs announced prior to COP26 that reduce annual GHG emissions to 48 (38-52) GtCO2-eq by 2030, or 2-9 GtCO2-eq below projected

			emissions from fully implementing NDCs announced prior to COP26, reduce the mitigation challenge for likely limiting warming to 2°C after 2030.
Chapter 3	81	7-8	This closes the implementation gap for the NDCs, and in addition falls below the emissions range implied by implementing unconditional and conditional elements of NDCs by 2-9 GtCO2-eq.
Chapter 3	40	4-6	Replace: As they need to reach net zero CO2 only a few years later, with 2030 CO2 emission levels being around twice as high, they imply post-2030 CO2 emissions reduction rates that are almost double that of pathways limiting warming to 1.5°C with no or limited overshoot With: As they need to reach net zero CO2 only a few years later, from 2030 CO2 emission levels that are about as high as 2020 levels, they imply post-2030 CO2 emissions reduction rates that are substantially higher (by around 30%) than in pathways limiting warming to 1.5°C with no or limited overshoot
Chapter 3	40	Footnote 6	Replace Pathways that follow emission levels projected from the implementation of current NDCs until 2030 and that still likely limit warming to 2°C reach net zero CO2 emissions during 2065 - 2070 (2060 - ...) With Pathways that follow emission levels projected from the implementation of current NDCs until 2030 and that still likely limit warming to 2°C reach net zero CO2 emissions during 2065 - 2070 (2060 - 2100)
Chapter 3	41	11-13	Replace: the time lag between reaching net zero CO2 and net zero GHG is 11-14 (6-40) years and the amount of net negative CO2 emissions deployed to balance non-CO2 emissions at the time of net zero is -6 to -7 (-10 to -4) GtCO2 With: the time lag between reaching net zero CO2 and net zero GHG is 12-14 (7-39) years and the amount of net negative CO2 emissions deployed to balance non-CO2 emissions at the time of net zero GHG is around -7 (-10 to -4) GtCO2
Chapter 3	39	13	Cross-chapter box 3 Figure 1 to be updated to accommodate minor revisions to GHG emissions data shown in the left column.

Chapter 4	9	38-41	Replace: Moreover, though some countries like China have not submitted their updated NDCs yet, they have already announced their updated NDC goals somewhere. With: Moreover, though some countries have not submitted their updated NDCs yet, they have already announced their updated NDC goals somewhere.
Chapter 4	34	16-17	Replace: China and South Korea, have made announcements of carbon neutrality by 2060 and net zero GHG emission by 2050, respectively (UN 2020a,b). With: China and South Korea, have made announcements of carbon neutrality before 2060 and net zero GHG emission by 2050, respectively (UN 2020a,b).
Chapter 4	89	7	Replace: Research confirms that a border carbon tax (or adjustment), set on the basis of the carbon content of the import, including a downward adjustment on the basis of any carbon payments (taxes or other) already made before entry, could reduce carbon leakage while also raising additional revenue and encouraging carbon pricing in the exporting country (Withana & Sirini 2016; Cosbey et al 2019). With: Some research suggests that evidence that a border carbon tax (or adjustment), set on the basis of the carbon content of the import, including a downward adjustment on the basis of any carbon payments (taxes or other) already made before entry, could reduce carbon leakage while also raising additional revenue and encouraging carbon pricing in the exporting country (Withana & Sirini 2016; Cosbey et al 2019).
Chapter 4	Front	5	James S. Gerber
Chapter 4	Front	11	Carlisle Ford Runge
Chapter 5	Front page		Yacob Mulugetta Affiliation - Ethiopia/United Kingdom
Chapter 6	15	5-7	Replace: Growth in coal-fired electricity generation capacity in the Asia Pacific region has offset retirements in North America and Europe (Jakob et al. 2020). With: Growth in coal-fired electricity generation capacity in the Asia Pacific region has offset retirements in North America and Europe (Jakob et al. 2020, Global Energy Monitor et al., 2021).

Chapter 6	44	41-43	Replace: That said, recent years have seen a decrease in fossil EROI, especially as underground coal mining has continued in China. With: That said, recent years have seen a decrease in fossil EROI, especially as underground coal mining still represents a substantial portion of global production.
Chapter 6	121	44	Replace: Similarly, a subsidy promoted the installation of solar water heaters in Asia (Chang et al. 2009). With: Similarly, many programs have promoted the installation of lower-carbon household options such as heat pumps, district heating, or solar water heaters across Europe, the Asia-Pacific and Africa (Hu et al,. 2012; Sovacool and Martiskainen 2020; Ahmed et al. 2021). The following references to be added to the bibliography: • Ahmed, Sumair Faisal, Mohammad Khalid, Mahesh Vaka, Rashmi Walvekar, Arshid Numan, Abdul Khaliq Rasheed, Nabisab Mujawar Mubarak, Recent progress in solar water heaters and solar collectors: A comprehensive review, Thermal Science and Engineering Progress, Volume 25, 2021, 100981 • Hu R., Sun P., Wang Z. An overview of the development of solar water heater industry in China. Energy policy, 2012, 51: 46-51. • Sovacool, Benjamin K., Mari Martiskainen, Hot transformations: Governing rapid and deep household heating transitions in China, Denmark, Finland and the United Kingdom, Energy Policy, Volume 139, 2020, 111330
Chapter 6	44	41-42	Replace: That said, recent years have seen a decrease in fossil EROI, especially as underground coal mining has continued in China. With: That said, recent years have seen a decrease in fossil EROI, especially as underground coal mining has continued.
Chapter 6		figure 6.1 and correspondin g TS figure	Panel a (2019) Change: nuclear from 30 to 10 and geothermal 4 to 1.1
Chapter 7	75	39	Add the reference ‘Smith et al 2019a’ to the list of citations‘Leifeld 2016; Meemken and Qaim 2018’
Chapter 7	136		Daioglou et al., 2020b: Bioenergy technologies in long-run climate change mitigation: results from the EMF-33 study. Clim. Change, 163, 1603-1620, doi:10.1007/s10584-020-02799-y. Reference cited in text but missing from bibliography – provided by authors during FGD compilation

Chapter 7	101	25-26	Despite increased forest area in China, however, land use change and management potentially were net contributors to carbon emissions from 1990-2010 (Lai et al. 2016). Delete sentence
Chapter 8	41	16-20	Replace: However, there is significant regional variation; between 2000 and 2040, 12.5% of cropland in China and 7.5% of cropland in the Middle East and North Africa could be displaced due to urban expansion, compared to the world average of 3.7% (van Vliet et al. 2017). With However, there is significant regional variation; between 2000 and 2040, 12.5% of cropland in China and 7.5% of cropland in the Middle East and North Africa could potentially be displaced due to urban expansion, compared to the world average of 3.7% (van Vliet et al. 2017).
Chapter 9			Include the reference cited in text but missing from bibliography - Issock, P. B., M. Mpinganjira, and M. Roberts-Lombard, 2018: Drivers of consumer attention to mandatory energy-efficiency labels affixed to home appliances: An emerging market perspective. J. Clean. Prod., 204, doi:10.1016/j.jclepro.2018.08.299.
Chapter 9			Include the reference cited in text but missing from bibliography - Lee, D., 2020: PACE Financing Emerges as a Valuable Resource for Property Owners Rushing to Comply with NYC's New Climate Mobilization Act. Cornell Real Estate Rev., 18.
Chapter 9			Include the reference cited in text but missing from bibliography - Ramage, M. H., et al., 2017: The wood from the trees: The use of timber in construction. Renew. Sustain. Energy Rev., 68, doi:10.1016/j.rser.2016.09.107.
Chapter 9			Include the reference cited in text but missing from bibliography - Goldman, C. A., et al., 2020: What does the future hold for utility electricity efficiency programs? Electr. J., 33, doi:10.1016/j.tej.2020.106728.
Chapter 9			Include the reference cited in text but missing from bibliography - IEA, and UNDP, 2013: Modernising Building Energy Codes to Secure our Global Energy Future. IEA and UNDP, 74 pp.
Chapter 9			Include the reference cited in text but missing from bibliography - Henriquez, R., G. Wenzel, D. E. Olivares, and M. Negrete-Pincetic, 2018: Participation of Demand Response Aggregators in Electricity Markets: Optimal Portfolio Management. IEEE Trans. Smart Grid, 9, doi:10.1109/TSG.2017.2673783.
Chapter 9	Front page	Review Editor	Jessie Keenan now has two affiliations (the United States of America/Austria)
Chapter 9	75	16-17	Replace Only in China, the premature mortalities attributed to PM2.5 and O3 emissions exceeded 1.1 million in 2010 (Gu et al. 2018). With: According to the results of the quantitative model(Gu et al.

			2018), the premature mortalities attributed to PM2.5 and O3 emissions may reach 168000-1796000 (95% CI) in 2010.
Chapter 9	82	27-32	Several studies examined in the context of this assessment (see Table SM9.7) showed that direct rebound effects for residential energy consumption, which includes heating, are significant and range between -9% and 91%, with a median at 35% in Europe, 0-30% with a median at 20% in the US, and 72-127%, with a median at 89% in China. Replace: Several studies examined in the context of this assessment (see Table SM9.7) showed that direct rebound effects for residential energy consumption, which includes heating, are significant and range between -9% and 127%
Chapter 9	86	22-23	Replace: OECD countries, China and many developing countries (for example Ghana, Kenya, India, South Africa, etc.) (Chunekar, 2014) (Diawuo et al., 2018; Issock Issock et al., 2018) have adopted mandatory energy labelling. With: OECD countries, and many developing countries (for example China, Ghana, Kenya, India, South Africa, etc.) (Chunekar, 2014) (Diawuo et al., 2018; Issock Issock et al., 2018) have adopted mandatory energy labelling.
Chapter 9 Supplementary Material	13	5-6	Table SM9.5 header row, replace "Country" with "Country/region"
Chapter 10	6	12-14	Replace: Some literature suggests that explicitly including international shipping and aviation under the governance of the Paris Agreement could spur stronger decarbonisation efforts in these segments. with: Some authors in the literature have argued that including international shipping and aviation under the the Paris Agreement could spur stronger decarbonisation efforts in these segments.
Chapter 10	96	3-5	Replace: Some literature suggests that the governance of the international transport systems could be included the Paris Agreement process With Some authors in the literature have argued that the governance of the international transport systems could be included in the Paris Agreement process

Chapter 10	96	36-43	Some commentators have suggested that emissions from international aviation and shipping should be part of the Paris Agreement With Some authors in the literature have argued that emissions from international aviation and shipping should be part of the Paris Agreement
Chapter 10	Front	5	Ogheneruona E. Diemuodeke
Chapter 11	8		Table appears under Equation 11.1 relates to the equation but is missing a title Add sub-title: "Equation 11.1 variables, Factors, policies and drivers. "
Chapter 11	12	20	Replace: FOOTNOTE3 This conclusion is also valid separately for developed countries, rest of the world, and for China, when adjusted GDP for this country is used (Krausmann et al. 2020). With: FOOTNOTE3 This conclusion is also valid separately for developed countries and rest of the world (Krausmann et al. 2020).
Chapter 11	19	9-10	In 1970–2000, direct GHG emissions per unit of energy showed steady decline interrupted by noticeable growth in 2001–2018 driven by fast expansion of steel and cement production in China (Figure 11.5), where in 2000-2015 on average every month 12 heavy industrial facilities were built (IEA 2021a). With: In 1970–2000, direct GHG emissions per unit of energy showed steady decline interrupted by noticeable growth in 2001–2018 driven by fast expansion of steel and cement production (Figure 11.5)(IEA 2021a).
Chapter 11	19	14-16	Replace: Wang et al. (2021)'s conclusion that iron and steel carbon intensity stagnated in 1995–2015 due to skyrocketing carbon intensive material production in China and India (Figure 11.5) may be extended to 2020 (Bashmakov 2021) and to other basic materials With Iron and steel carbon intensity stagnated in 1995–2015 due to rapid growth in carbon intensive production in some countries (Wang et al. 2021)

Chapter 11	22	1-4	The dramatic increase in industrial emissions after 2000 is clearly associated with China's and other non-OECD Asian countries' economic growth, which dominated both absolute and incremental emissions (Figure 11.5a-b). FOOTNOTE22 In 2020 China accounted for nearly 60% of global steel and cement production (IEA 2021a) and in 2015 over than half of the material production associated emissions occurred in China (Hertwich 2021). With: The dramatic increase in industrial emissions after 2000 is clearly associated with economic growth in Asia, which dominated both absolute and incremental emissions (Figure 11.5a-b). [FOOTNOTE22 should be deleted]
Chapter 11	77	40-41	Replace: Tong et al. (2019) use unpublished unit-level data from China's Ministry of Ecology and Environment to obtain a more robust estimate of the age profile of existing capacity in the cement and iron and steel sectors in the country With: Tong et al. (2019) use unit-level data from China's Ministry of Ecology and Environment to obtain a more robust estimate of the age profile of existing capacity in the cement and iron and steel sectors in the country
Chapter 12	127-128	42-3	Li et al. (2020) calls for coordinated efforts to reduce emissions in trade flows in pairs of the economies with the highest leakage such as China and the United States, China and Germany, China and Japan, Russia and Germany. With: Li et al. (2020) calls for coordinated efforts to reduce emissions embodied in trade flows in pairs of economies with the highest leakage
Chapter 12	12-15	20	"Other technologies show mostly positive mitigation potentials ...." should be: "Other technologies show mostly positive mitigation costs ...."
Chapter 12	12-22	Industry, bottom	"The numbers for the industry sector typically have an uncertainty of ±25%" should be replaced by: "The numbers for the industry sector typically have an uncertainty of ±25%, unless indicated differently"
Chapter 12	39	1	In figure 2, the x-axis to show only years 2010 and 2100, everything in between removed
Chapter 12	40	12	OLD: "the annual net CO2 removal (i.e., gross removals, including A/R, minus gross emissions) on managed land reaches" - NEW: "the reported annual CO2 removal from AFOLU (mainly A/R) reaches"
Chapter 12	40	15	add footnote after the sentence ending with "percentile range)" - "Cumulative CDR from AFOLU cannot be quantified precisely because models use different reporting

			methodologies that in some cases combine gross emissions and removals, and use different baselines."
Chapter 12	40	18	OLD: "net CO2 removal on managed land" - NEW: "CO2 removal from AFOLU"
Chapter 12	41	2	Labels in Figure 12.3 OLD: Net removal on managed land - NEW: Removal from AFOLU
Chapter 12	41	3	OLD: "net CO2 removal on managed land (that is, gross removal through A/R minus emissions from deforestation)" - NEW: "CO2 removal from AFOLU (mainly A/R)
Chapter 12	41	3	OLD: Sequestration of three predominant CDR methods NEW: Sequestration through three predominant CDR methods
Chapter 12	41	1	OLD: "Net removal on managed land" - new: "AFOLU"
Chapter 12	41	1	OLD: "Net removal on managed land (n=344)" - new: "AFOLU (n = 344)"
Chapter 12	42	10	OLD: "AFOLU sector (through A/R)" - NEW "AFOLU (through A/R)"
Chapter 12	56	27	OLD: "Cumulative net CO2 removals on managed land (CDR through A/R minus land C losses due to deforestation)" - NEW: "cumulative CO2 removal from AFOLU (mainly through A/R), as reported from models, "
Chapter 12	4	16	OLD: "net CO2 removal on managed land (including A/R)" - NEW: "CO2 removal from AFOLU (mainly A/R)"
Chapter 12	4	16	NEW: If we can have a footnote in ES, then please add footnote to saying "Cumulative CDR from AFOLU cannot be quantified precisely because models use different reporting methodologies that in some cases combine gross emissions and removals, and use different baselines."
Chapter 12	4	19	OLD: "net CO2 removal on managed land (including A/R)" - NEW: "CO2 removal from AFOLU (mainly A/R)"
Chapter 12	4	16	OLD: "cumulative volumes of" - NEW: "reported cumulative volumes of"
Chapter 12	58	3	OLD: "CDR option" - New "CDR method"
Chapter 13	27	43	Delete 'Clemens 1997' from the list of in-text citations
Chapter 13	99	34-35	Delete 'Clemens, E. S., 1997: The People's Lobby: Organizational Innovation and the Rise of Interest Group Politics in the United States 1890-1925. The University of Chicago Press, Chicago and London, 467 pp.'
Chapter 13	28	4	Delete 'Meyer and Tarrow 1997' from the list of in-text ciations
Chapter 13	132	30-31	Delete 'Meyer, D. S., and S. Tarrow, eds., 1997: The Social Movement Society: Contentious Politics for a New Century. Rowman & Littlefield Publishers, Washington D.C, 292 pp.
Chapter 13	27	33	Delete 'Salt and Layzell 1985' from the list of in-text citations
Chapter 13	143	45-46	Delete 'Salt, C., and J. Layzell, 1985: Here We Go!: Women's Memories of the 1984/85 Miners Strike. London Political Committee Co-operative Retail Services Limited, 88 pp.'

Chapter 13	24	22-32	Replace: Evidence shows that CO_2 emissions increase with corruption, either through the direct negative effect of corruption on law enforcement, including in the forestry sector (Sundström 2016), or through the negative effect of corruption on countries' income (Welsch 2004). With Evidence shows that CO_2 emission levels can be affected by corruption, either through the direct negative effect of corruption on law enforcement, including in the forestry sector (Sundström 2016), or through the negative effect of corruption on countries' income (Welsch 2004).
Chapter 13	30	8-13	Overall, courts have also played a more active role for climate governance in democratic political systems (Peel and Osofsky 2015; Eskander et al. 2021), but recently legal reforms have also developed in other countries, such as the environmental public interest law in China that allows individuals and groups to initiate environmental litigation (Xie and Xu 2021; Zhao et al. 2019). Whether and to what extent differing law traditions and political systems influence the role and importance of climate litigation has, however, not been examined enough scientifically (Peel and Osofsky 2020; Setzer and Vanhala 2019). With : Overall, courts have also played a more active role for climate governance in democratic political systems (Peel and Osofsky 2015; Eskander et al. 2021). Whether and to what extent differing law traditions and political systems influence the role and importance of climate litigation has, however, not been examined enough scientifically (Peel and Osofsky 2020; Setzer and Vanhala 2019).
Chapter 13	53	34-35	A paper cites Taiwan's green public procurement law, which has contributed to reduced emissions intensity (Tsai 2017). In practice, awareness and knowledge of 'green' public procurement techniques and procedures is decisive for climate-friendly procurement (Testa et al. 2016). With A paper cites Taiwan (province of China) green public procurement law, which has contributed to reduced emissions intensity (Tsai 2017). In practice, awareness and knowledge of 'green' public procurement techniques and procedures is decisive for climate-friendly procurement (Testa et al. 2016).

Chapter 14	81	15	Another aspect is finance; Gallagher et al. (2018) examine the role of national development finance systems, focusing in particular on China. While there has been a great deal of finance devoted to renewable energy, they find the majority of finance devoted to projects associated either with fossil fuel extraction or with fossil fuel-fired power generation. Delete: "focusing in particular on China."
Chapter 14	81	18-19	Ascensão et al. (2018) similarly suggest that activities associated with the Belt and Road Initiative could play a role in slowing down mitigation efforts in developing countries. Delete sentence
Chapter 14	Front	5	Agus P. Sari
Chapter 15	21	25	In 2019, global GFCF reached 23 trillion USD compared to 16.2 trillion USD in 2010, a 42% increase (Figure 15.2) Should be changed to: In 2019, global GFCF reached around 20 trillion USD2015 compared to around 14 trillion USD2015 in 2010, a more than 40% increase (Figure 15.2).
Chapter 15	35	17	higher total needs until 2030, around 1.8 trillion USD yr-1 in buildings and 1.7 trillion USD yr-1 in industry are needed in the 1.5-S and TES scenario. Should be changed to: higher total needs until 2030, around 1.8 trillion USD yr-1 in buildings and industry are needed in the 1.5-S.
Chapter 15	35	19	For the TES total EE investment needs until 2030 are stated at 29 trillion USD translating into an yearly average of around 1.8 trillion USD yr-1. Should be changed to: For the TES cumulative EE investment needs until 2030 are stated at 29 trillion USD translating into an yearly average of around 1.7 trillion USD yr-1, excluding transportation
Chapter 15	35	24	The assessment comprises road, rail and airports/ports infrastructure with only rail infrastructure being considered in our analysis amounting to 0.4 trillion USD on average until 2030. On a regional level, (Oxford Economics 2017) shows, that annual infrastructure investments between 2016 and 2040 vary widely. For all available countries (n=50) estimates counts close to 0.4 trillion USD, including 0.2 trillion USD for China. Based on available data for 9 African countries, investments in rail infrastructure range from 0.1 billion USD in Senegal to 1.6 billion USD in Nigeria. (Osama et al. 2021) highlights a 4.7 billion USD financing gap for African countries in the transport sector. In Latin America the report identifies Brazil as frontrunner of required rail investments with 8.3 billion USD, followed by Peru with 2.3 billion USD. Totally, developed countries mounting up to 117 billion USD yr-1 (n=14, mean=8.35bn USD) for rail infrastructure funding needs, succeeded by developing countries (excl. LDCs) with 26 billion USD yr-1 (n=28, mean=0.93bn USD, excluding China). Should be changed to:

			The assessment comprises road, rail and airports/ports infrastructure with only rail infrastructure being considered in this analysis. On a regional level Oxford Economics (2017) shows, that annual infrastructure investments between 2016 and 2040 vary widely. For all available countries (n=50) estimates counts close to 0.4 trillion USD yr-1, including 0.217 trillion USD yr-1 for China. Based on available data for nine African countries, investments in rail infrastructure range from 0.1 billion USD yr-1 in Senegal to 1.6 billion USD yr-1 in Nigeria. Osama et al. (2021) highlights a 4.7 billion USD financing gap for African countries in the transport sector. In Latin America Brazil requires rail investments of 8.3 billion USD yr-1, followed by Peru with 2.3 billion USD yr-1, and Chile with 2.1 billion USD yr-1. In total, developed countries mounting up to almost 120 billion USD yr-1 (n=15, mean=7.97bn USD yr-1) for rail infrastructure financing needs. Estimates for available developing countries adds up to almost 50 billion USD yr-1 (n=27, mean=1.78bn USD yr-1, excl. China and LDCs) (Oxford Economics 2017).
Chapter 15	36	8	derives average yearly investment needs of around 278 billion USD yr-1 until 2030 and 431 USD billion yr-1 in the next several decades, Should be changed to: and derives average yearly investment needs of around 278 billion USD yr-1 in the next several decades, including opportunity costs
Chapter 15	38	24	between 15.9% in 2035 (Oxford Economics 2017) and 32% (Arezki et al. 2016). Should be changed to: between 19% (Oxford Economics 2017) and 32% (Arezki et al. 2016)
Chapter 15	83	2	Individual and clubs of developed and developing countries currently provide public guarantees (ADB 2015; IIGCC 2015; Pereira Dos Santos 2018; GGGI 2019; PIDG 2019; AGF 2020; Garbacz et al. 2021). --> Individual and clubs of developed and developing countries currently provide public guarantees (ADB 2015, 2018; IIGCC 2015; Pereira Dos Santos 2018; GGGI 2019; Garbacz et al. 2021).
Chapter 15	84	42	LDCs are least likely to have active capital markets. Clubs of LDCs are partnering with AAA MDBs in aggregation approaches (AfDB 2020; GCF 2020b). --> LDCs supported by humanitarian entities are least likely to have active capital markets (ICRC 2020; IDFC 2020; Cao et al. 2021b). Clubs of LDCs are partnering with AAA MDBs in aggregation approaches (AfDB 2020; GCF 2020b).

Chapter 15	85	12	i) lack of aid and debt transparency (Moyo 2009; Mkandawire 2010; PWYF 2020) ii) mining-fossil fuels sector and illicit finance (Plank 1993; Sachs and Warner 2001; Hanlon 2017b)) iii) lack of developed country commitment to pledges (Nhamo and Nhamo 2016) iv) unregulated players as financial intermediaries in blended finance (Pereira 2017; Donaldson and Hawkes 2018; Tan 2019) v) weak accountability reflected in soft SDG data measurement and vi) burden of responsibility in mobilising resources for Paris and SDG to countries with historically soft institutional capacity (Hickel 2015; Donald and Way 2016; Scheyvens et al. 2016; Liverman 2018). --> i) multilaterals model, lack of transparency around aid and debt (Mkandawire 2010; Lee 2017; PWYF 2019; Bradlow 2021; Gianfagna et al. 2021) ii) illicit finance (Plank 1993; Sachs and Warner 2001; Hanlon 2017; US DoJ 2019)) iii) lack of developed country commitment to pledges (Nhamo and Nhamo 2016) iv) unregulated players as financial intermediaries in blended finance (Pereira 2017; Donaldson and Hawkes 2018; Attridge and Engen 2019; Tan 2019) v) weak accountability reflected in soft SDG data and vi) burden of responsibility in mobilising Paris and SDG resources falling to countries with historically soft institutional capacity (Hickel 2015; Donald and Way 2016; Scheyvens et al. 2016; Liverman 2018).
Chapter 15	33	16	Replace Table 15.3 - (Storage) see end of doc for revised version
Chapter 15		Figure 15.4	Replace Figure 15.4 see end of doc for revised version
Chapter 15	Front page	Review Editors	Remove Jean-Charles Hourcade as review editor
Chapter 15	21	16	almost 80 trillion USD in 2019), -> around 80 trillion USD2015 in 2019),
Chapter 15	21	25	In 2019, global GFCF reached 23 trillion USD compared to 16.2 trillion USD in 2010, a 42% increase (Figure 15.2) --> In 2019, global GFCF reached around **20 trillion USD2015** compared to around **16 trillion USD2015 in 2010**, a more than 40% increase (Figure 15.2).
Chapter 15	35	17	higher total needs until 2030, around **1.8 trillion USD yr-1 in buildings and 1.7 trillion USD yr-1 in industry are needed in the 1.5-S and TES scenario.** For the TES total EE investment needs until 2030 are stated at 29 trillion USD translating into an yearly average of around 1.8 trillion USD yr-1. --> higher total needs until 2030, around **1.8 trillion USD2015 yr-1 in buildings and industry are needed in the 1.5-S.** For the TES cumulative EE investment needs until 2030 are stated at 29 trillion USD2015 translating into an yearly average of around 1.7 trillion USD2015 yr-1, excluding transportation.

Chapter 15	35	24	The assessment comprises road, rail and airports/ports infrastructure with only rail infrastructure being considered in our analysis amounting to 0.4 trillion USD on average until 2030. On a regional level, (Oxford Economics 2017) shows, that annual infrastructure investments between 2016 and 2040 vary widely. For all available countries (n=50) estimates counts close to 0.4 trillion USD, including 0.2 trillion USD for China. Based on available data for 9 African countries, investments in rail infrastructure range from 0.1 billion USD in Senegal to 1.6 billion USD in Nigeria. (Osama et al. 2021) highlights a 4.7 billion USD financing gap for African countries in the transport sector. In Latin America the report identifies Brazil as frontrunner of required rail investments with 8.3 billion USD, followed by Peru with 2.3 billion USD. Totally, developed countries mounting up to 117 billion USD yr-1 (n=14, mean=8.35bn USD) for rail infrastructure funding needs, succeeded by developing countries (excl. LDCs) with 26 billion USD yr-1 (n=28, mean=0.93bn USD, excluding China). --> The assessment comprises road, rail and airports/ports infrastructure with only rail infrastructure being considered in this analysis. On a regional level Oxford Economics (2017) shows, that annual infrastructure investments in rail between 2016 and 2040 vary widely. For all available countries (n=50) estimates counts close to 0.4 trillion USD2015 yr-1, including 217 billion USD2015 yr-1 for China. Based on available data for nine African countries, investments in rail infrastructure range from 0.1 billion USD2015 yr-1 in Senegal to 1.6 billion USD2015 yr-1 in Nigeria. Osama et al. (2021) highlights a 4.7 billion USD financing gap for African countries in the transport sector. In Latin America, Brazil requires rail investments of 8.3 billion USD2015 yr-1, followed by Peru and Chile with 2.3 and 2.1 billion USD2015 yr-1. In total, developed countries mounting up to almost 120 billion USD yr-1 **(n=15, mean=7.97 bn USD yr-1)** for rail infrastructure investment needs. Estimates for available developing countries adds up to almost 50 billion USD yr-1 **(n=27, mean=1.78bn USD yr-1, excl. China and LDCs), and available data for seven LDCs (mean=0.34 bn USD yr-1) shows data gaps for specific countries (Oxford Economics 2017).**
Chapter 15	36	8	derives average yearly investment needs of around **278 billion USD yr-1 until 2030 and 431 USD billion yr-1 in the next several decades,** -> derives average yearly investment needs of around **278 billion USD2015 yr-1 until 2030 rising to 431 USD2015 billion yr-1 over the next several decades, including opportunity costs**
Chapter 15	38	24	between 15.9% in 2035 (Oxford Economics 2017) and 32% (Arezki et al. 2016). --> between **19%** (Oxford Economics 2017) and 32% (Arezki et al. 2016)

Chapter 15	80	36	Although AAA-rated IFC blended finance fund was established in 2013**, it took on seven of its eight institutional investors in 2017 with insurers AXA and Swiss Re investing 500 million USD each to bring the fund to 7 billion USD raised from eight global investors (Attridge and Gouett 2021).** --> Although AAA-rated IFC blended finance fund was established in 2013, **most investors joined in 2017 with insurers AXA and Swiss Re investing 500 million USD each to bring the fund to 7 billion USD raised from eight global investors (Atteridge and Gouett 2021)**
Chapter 15		Figure 15.4 caption	Total Needs: See Table 15.4. Regional breakdown of needs: For Electricity based on IAM output for Non-Biomass renewable (mean C1:C3) plus incremental investment needs for T&D and Storage (mean C1:C3 less mean C5:C7) (see Table 15.2, 15.3., except C6 and C7). --> Total needs: See Table 15.4. Regional breakdown of needs: For Electricity based on IAM output for Non-Biomass renewable and Storage (mean C1:C3) plus incremental investment needs for T&D (mean C1:C3 less C5) (see Table 15.2, 15.3).
Chapter 15	23	Table 15.1	**TSU: As discussed with Jim and Alaa, adding two lines with values deflated to USD2015 : see end of doc for revised version**
Chapter 15	23	Table 15.1 Note	Note: Standing Committee on Finance (SCF). Numbers in current billion USD. Deflated to USD2015 in *italic*. Given the variations in numbers reported by different entities,
Chapter 15	23	Figure 15.3	Note: Numbers in billion USD. -> Note: Numbers in current billion USD. Deflated to USD2015 see Table 15.1 in *italic*.
Chapter 15	23	Figure 15.3	**caption of figure 15.3 edits**: remove the "0" in the legend and, and replace it with “no regional mapping” in the figure legend. see end of doc for revised version
Chapter 15	36	8	[cross-reference] -> remove
Chapter 15	36	Table 15.4	**see end of doc for revised version**
Chapter 15	36	Table 15.4	<u>*For AFOLU:*</u> Chapter 7 analysis, Section 7.4; The Food and Land use Coalition (Shakhovskoy et al. 2019) -> Chapter 7 analysis, Section 7.4; The Food and Land use Coalition (2019); Shakhovskoy et al. (2019)
Chapter 15	36	Table 15.4 Note	Note: Total range 2.4 trillion to 4,8 trillion USD yr-1. -> Note: Total range **2.3** trillion to **4.5** trillion USD yr-1.
Chapter 15	39	15	current climate finance flows -> **recent** climate finance flows
Chapter 15	42	11	Estimated mitigation financing needs as percentage of current GDP (USD2015) comes in at around 2-4% for developed countries, and around 5-10% for developing countries (see Figure 15.4) (high confidence). Climate finance flows have to increase by factor 4-8 in developing countries and 2-5 in developed countries. -> Estimated mitigation financing needs as percentage of **mean 2017-2020 GDP in USD2015** comes in at around 2-4% for developed countries, and around **4-9%** for developing

			countries (see Figure 15.4) (high confidence). Climate finance flows have to increase by factor **4-7** in developing countries and **3-5** in developed countries.
Chapter 15	42	17	Flows to Eastern Asia, with i**ts average flows of 269 billion USD b**eing dominated by China (more than 95% of total mitigation flowsto Eastern Asia), would have to increase by a factor of 2-4, -> Flows to Eastern Asia, with **its annual average flows (2017-2020) of 252 billion USD2015 being** dominated by China (more than 95% of total mitigation flows to Eastern Asia), would have to increase by a factor of 2-4,
Chapter 15	42	33	Notably, climate finance flows to African countrie**s might have even decreased by about one fifth for mitigation technology** deployment -> Notably, climate finance flows to A**frican countries might have even decreased for mitigation technology deployment**
Chapter 15	26	8	in 2018 2018 (OECD 2020b). --> in 2018 (OECD 2020b).
Chapter 15	27	21	reached USD 687 billion --> reached 687 billion USD
Chapter 15	34	23	reaching on average around 1 USD trillion yr-1 (average until 2030) for electricity generation as well as grids and storage, increasing to above 2 USD trillion yr-1 (average until 2030) in the 1.5 scenario (IRENA 2021) --> reaching on average around 1 USD2015 trillion yr-1 (average until 2030) for electricity generation as well as grids and storage, increasing to above 2 USD2015 trillion yr-1 (average until 2030) in the 1.5 scenario (IRENA 2021)
Chapter 15	34	26	between 1.1 USD trillion yr-1 and 1.6 USD trillion yr-1 (average until 2030) --> between around 1.0 USD2015 trillion yr-1 and around 1.6 USD2015 trillion yr-1 (average until 2030)
Chapter 15	34	35	decrease from 5.0 trillion USD until 2030 yr-1 to 3.8 trillion USD yr-1 for 2030-2050 --> decrease from 5.0 trillion USD2015 until 2030 yr-1 to 3.8 trillion USD2015 yr-1 for 2030-2050
Chapter 15	34	37	remain flat at 2.2 trillion USD yr-1 through the coming three decades --> remain flat at 2.2 trillion USD2015 yr-1 through the coming three decades
Chapter 15	35	45	IEA indicates a total of around 0.6 and 0.8 trillion USD yr-1 for transport energy efficiency in the SDS and IEA scenario for the 2026-2030 period --> IEA indicates a total of around 0.6 and 0.7 trillion USD2015

			yr-1 for transport energy efficiency in the SDS and IEA scenario for the 2026-2030 period
Chapter 15	35	15	For the 1.5-S average yr-1 needs until 2050 come in at 963 billion **USD** for buildings, 102 billion USD for heat pumps, and 354 billion USD for industry. Applying the relative share of these categories on higher total needs until 2030, around 1.8 trillion USD yr-1 in buildings and 1.7 trillion USD yr-1 in industry are needed in the 1.5-S and TES scenario --> For the 1.5-S average yr-1 needs until 2050 come in at 963 billion **USD2015 fo**r buildings, 102 billion USD2015 for heat pumps, and 354 billion USD2015 for industry. Applying the relative share of these categories on higher total needs until 2030, around 1.8 trillion USD2015 yr-1 in buildings and 1.7 trillion USD2015 yr-1 in industry are needed in the 1.5-S and TES scenario
Chapter 15	35	20	level at 0.6 and 0.8 billion USD yr-1 on average between 2026-2030 -> level at around 0.6 and 0.8 trillion USD2015 yr-1 on average between 2026-2030
Chapter 15	35	43	For the 1.5-S scenario, IRENA indicates average investment needs of 0.2 trillion USD yr-1 for electric vehicle infrastructure, 0.2 trillion USD yr-1 for transport energy efficiency and 0.3 trillion USD yr-1 for EV batteries (IRENA 2020d) (average until 2030). -->For the 1.5-S scenario, IRENA indicates average investment needs of 0.2 trillion USD2015 yr-1 for electric vehicle infrastructure, 0.2 trillion USD yr-1 for transport energy efficiency and 0.3 trillion USD2015 yr-1 for EV batteries (IRENA 2020d) (average until 2030).
Chapter 15	23	10	with Brazil, India, China and South Africa accounting for 25% to 43% depending on -> with Brazil, India, China and South Africa accounting for around one-quarter to more than a third depending on
Chapter 15	24	17	between 90% and 95% between 2017 and 2020 -> consistently above 90% between 2017 and 2020
Chapter 15	9	40	385 billion USD yr-1 -> 385 billion USD(FOOTNOTE) yr-1 *FOOTNOTE*: In the chapter, USD units are used as reported in the original sources in general. Some monetary quantities have been adjusted selectively for achieving comparability by deflating the values to constant US Dollar 2015. In such cases, the unit is explicitly expressed as USD2015.
Chapter 15	13	42	countries of 40 billion USD -> countries of 40 billion USD(FOOTNOTE) *FOOTNOTE*: In the chapter, USD units are used as reported in the original sources in general. Some monetary quantities have been adjusted selectively for achieving comparability by deflating the values to constant US Dollar 2015. In such cases, the unit is explicitly expressed as USD2015.
Chapter 15	21	16	70 trillion USD2015 -> 70 trillion USD2015(FOOTNOTE) *FOOTNOTE:In the chapter, USD units are used as reported in the original sources in general. Some monetary quantities*

			have been adjusted selectively for achieving comparability by deflating the values to constant US Dollar 2015. In such cases, the unit is explicitly expressed as USD2015.
Chapter 15	34	0	Reference C5 category for T&D shown because it is used for calculation of incremental needs for Figure 4. -> *(REMOVE) duplication in the caption*
Chapter 15	40	27	approximately 1.61 trillion USD yr-1 -> approximately 1.61 trillion USD(FOOTNOTE) yr-1 *FOOTNOTE: In the chapter, USD units are used as reported in the original sources in general. Some monetary quantities have been adjusted selectively for achieving comparability by deflating the values to constant US Dollar 2015. In such cases, the unit is explicitly expressed as USD2015.*
Chapter 15	48	39	24.2 trillion USD, -> 24.2 trillion USD(FOOTNOTE), *FOOTNOTE: In the chapter, USD units are used as reported in the original sources in general. Some monetary quantities have been adjusted selectively for achieving comparability by deflating the values to constant US Dollar 2015. In such cases, the unit is explicitly expressed as USD2015.*
Chapter 15	4	5	The gaps represent a major challenge for developing countries, especially Least Developed Countries (LDCs), where flows have to increase by factor 4 to 8, -> The gaps represent a major challenge for developing countries, especially Least Developed Countries (LDCs), where flows have to increase by factor 4 to 7,
Chapter 16	4	35	in-text citation 'Box 16.5' should be Box 16.10 (the box on agriculture)
Chapter 16	5	29	add line of sight: {16.6}.
Chapter 16	5	38	in-text citation 'Box 16.10' should be Box 16.9 (the box on IPR)
Chapter 16	17	10 & 17	replace Aghion et al 2013 with Aghion et al 2016
Chapter 16	22	30	replace Aghion et al 2013 with Aghion et al 2016
Chapter 16	74	Figure 16.3	replace the figure 16.3 see end of doc for revised version
Chapter 16	77	18	CCB12 Authors list: **Maria Figueroa** should read **María Josefina Figueroa Meza**
Chapter 16	1	13	Joni Juspesta (Indonesia) should read **Joni Jupesta (Indonesia/Japan)**
Chapter 16	18	25	Joni Juspesta (Indonesia) should read **Joni Jupesta (Indonesia/Japan)**
Chapter 16	Front	6	Ambuj D. Sagar
Chapter 17	24	51-53	Coal has hitherto been the dominant energy source in China and has accounted for more than 70% of its total energy consumption for the past twenty years, falling to 64% in 2015 (The National BIM Report 2018). In the 13th Five Year Plan (2016-2020), for the first time China included the target of a national coal consumption cap of 4.1 billion tons for 2020, as well as a goal of reducing the primary energy share of coal to 58% by 2020 from the level of 64% in 2015 (The National People's Congress of the People's Republic of China 2016). Delete paragraph

Chapter 17	55	7-9	Replace: For example, the case of coal-fired power in China (section 17.3) shows that a transition to a lower carbon system is unlikely to happen even if models find it technically feasible and cost-effective. With "A transition to a lower carbon system is unlikely to happen even if models find it technically feasible and cost-effective."
Annex II	Front page	Lead Authors	Stephane de la Rue du Can, **not** Stephane de la Rue de le Can
Annex II	II-3	15-16	"This covers geographical regions, and also identifies developed regions, developing regions and least developed countries" should read. "This covers geographical regions and , at the time of the literature cut-off date, identified developed regions, developing regions and least developed countries".
Annex II	II-5	3	Ukraine should be deleted from the "Southern and Eastern Europe" list and allocated to "Eastern Europe and West-Central Asia"
Annex II	II-5	7	Republic of North Macedonia should be deleted from the "Eastern Europe and West-Central Asia" list and allocated to "Southern and Eastern Europe"
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'In this report, three different levels of classification are used…' should read 'In this report, two different levels of classification are used'
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'This covers geographical regions, and also identifies developed regions, developing regions and least developed countries.' should read 'This covers geographical regions, and, at the time of the literature cut-off date, also identified developed regions, developing regions and least developed countries.'
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'The high-level classification has six categories (Table 1): one for all developed countries and five covering developing countries.' should read 'The high-level classification has six categories (Table 1): one covering North America, Europe, and Australia, Japan and New Zealand, labelled "developed countries", and five covering other countries, all classified as developing using the M49 standard at the cut-off date.'
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'The intermediate-level classification (ten categories) divides Developed Countries into three geographical regions, and Asia and Developing Pacific into three sub-regions. The low-level classification (twenty-one regions) further sub-divides Developed Countries, Latin America and the Caribbean, Africa and Asia.' should read 'The low-level classification (ten categories) divides developed countries into three geographical regions, and Asia and Pacific into three sub-regions.'
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'The high- and intermediate-level classification schemes reflect schemes used in many global models and statistical sources. The sectoral and cross-cutting chapters of the report, which go into more detail, may make use of the low level-classification.' Should read 'The high- and low-level classification schemes reflect schemes used in many global models and statistical sources.'

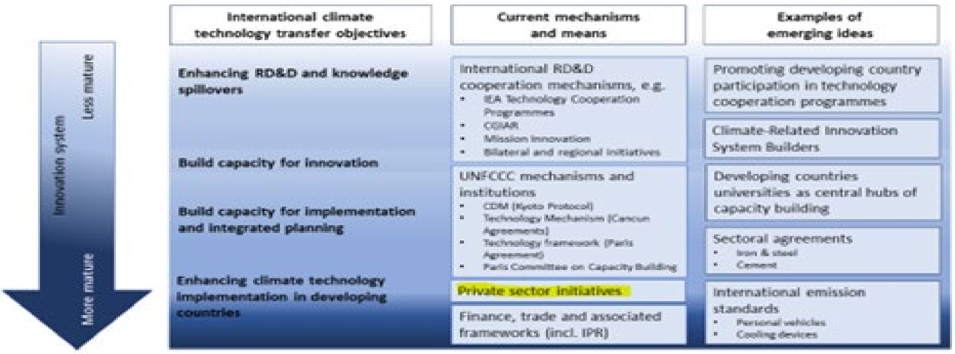
Annex II	p. II-3	Section 1, Classification schemes for countries and areas	'The detailed composition of countries and areas to the low-level classification is shown in section 1.1. The classification scheme deviates from the UN regional classification to ensure that Annex I, Annex II and non-Annex I…' should read 'The detailed allocation of countries and areas to the low-level classification is shown in section 1.1. Following AR5, the classification scheme deviates from the UN regional classification with the result that Annex I, Annex II and non-Annex I…'
Annex II	p.II-4	Section 1.1. Low level of regional classification	Section 1.1. Low level of regional classification should read as below: Africa: Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Côte d'Ivoire, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, SÃ£o TomÃ© and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe Middle East: Bahrain, Iran (Islamic Rep.), Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, State of Palestine, Syrian Arab Republic, United Arab Emirates, Yemen (Rep.) Latin America and Caribbean: Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines Trinidad and Tobago, Suriname, Trinidad and Tobago, Uruguay, Venezuela (Bolivarian Republic of) North America: Canada, United States of America (the) Eastern Asia: China, Korea (the Republic of), Korea (the Democratic People's Republic of), Mongolia Southern Asia: Afghanistan, Bangladesh, Bhutan, India Maldives, Nepal, Pakistan, Sri Lanka South-East Asia and Pacific: Brunei Darussalam, Cambodia, Cook Islands, Fiji, Indonesia, Kiribati, Lao People's Democratic Republic, Malaysia, Marshall Islands, Micronesia (Fed. Sts.), Myanmar, Nauru, Niue, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Vietnam Europe: Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland Australia, Japan, and New Zealand Eastern Europe and West-Central Asia : Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyz Republic, Republic of

			Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan International shipping and Aviation
SPM	Front page	Yacob Mulugetta	Affiliation - Ethiopia/United Kingdom
TS	Front page	Tek Sapkota	Affiliation - Nepal/Canada
TS	Front page	Review editor	Change affiliation of Tek Sapkota to Nepal/Canada
TS	47	9	Chapter 3 (p6L42) gives energy crop area for 2100, while P65L13 gives the same number but says it is for 2050 (P96L39). 2050 is correct. Change TS P47L9 to "2050" change chapter 3 P6L42 to "2050"
TS	39	20-23	Replace: Cost-effective mitigation pathways assuming immediate action to likely limit warming to 2°C are associated with net global GHG emissions of 30-49 GtCO2-eq yr-1 by 2030 and 13-26 GtCO2-eq yr-1 by 2050 (medium confidence) With: Cost-effective mitigation pathways assuming immediate action to likely limit warming to 2°C are associated with net global GHG emissions of 30-49 GtCO2-eq yr-1 by 2030 and 14-27 GtCO2-eq yr-1 by 2050 (medium confidence)
TS	49	9-14	TS Box 6: net-zero dates and ranges (P49L9-14) are inconsistent with those stated in table TS.3. Adjusted ranges in text to be consistent with those given in the Table.
TS	61	6	TS 5.2: P61L6 says "for most regions, per capita urban emissions are lower than per capita national emissions". This is based on "excluding aviation, shipping and biogenic sources", and that should be added for clarification. Applies to TS, as well as chapter 8 ES.
TS	61	16-18	TS5.2: P61L16-18: add clarification that this is excluding aviation, shipping, and biogenic sources
Technical Summary	123	6	LDCs), where flows have toincrease by the factor of four to eight for specific sectors -> LDCs), where flows have to increase by the factor of four to **seven** for specific sectors
Technical Summary	94	10	OLD: "net CO2 removal on managed land (including A/R)" - NEW: "CO2 removal from AFOLU (mainly A/R)"
Technical Summary	94	13	OLD: "net CO2 removal on managed land (including A/R)" - NEW: "CO2 removal from AFOLU (mainly A/R)"
Technical Summary	96	2	OLD: "CDR option" - New "CDR method"
Technical Summary	97	1	OLD: "CDR option" - New "CDR method"
Technical Summary	97	1	OLD: ""Blue carbon" in coastal wetlands" - New "Blue carbon management"
Technical Summary	96	2	OLD: Most TRL values in parentheses - NEW: remove all parentheses

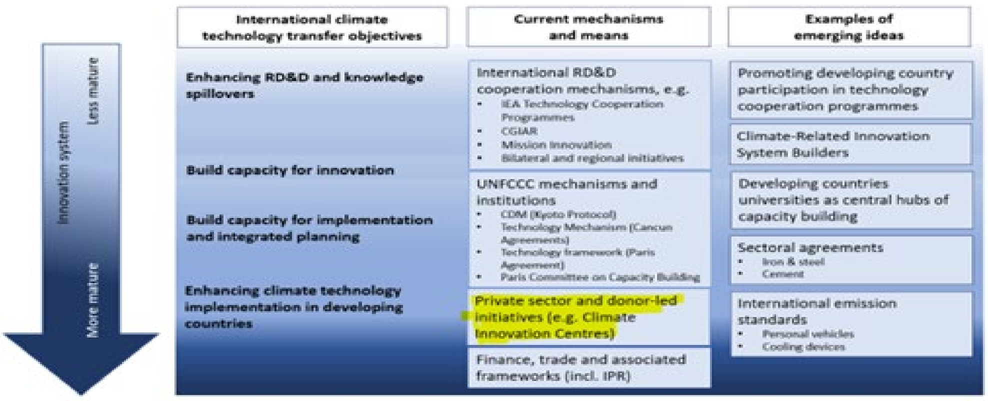
Technical Summary	47	13	From 'for residual GHG emissions, even after sub+B4:E528stantial direct emissions' to 'for residual GHG emissions, even alongside substantial direct emissions '

Corrected Figure 16.3

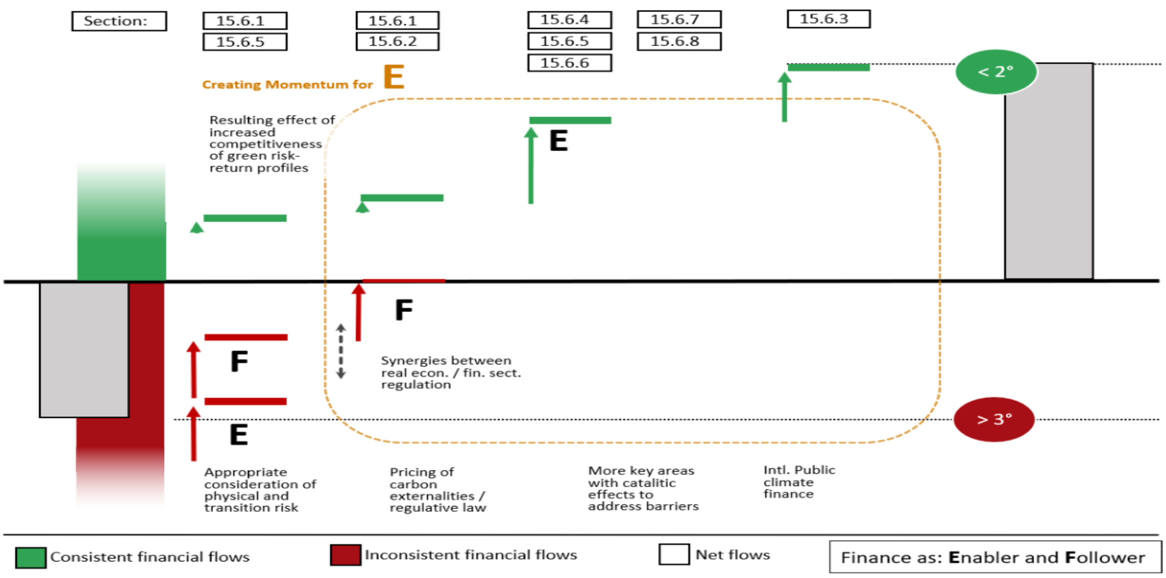
FGD Figure 16.3



NEW Figure 16.3



Corrected Ch 15 Figure 15.5



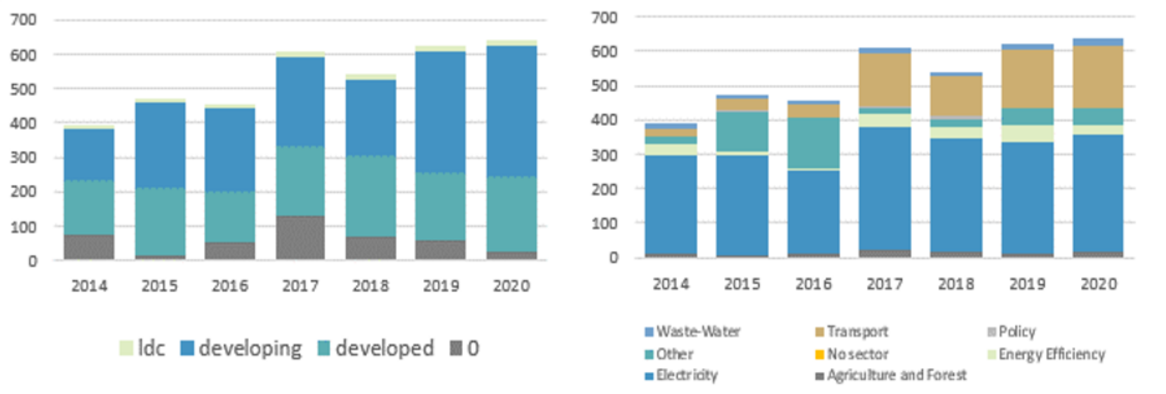
Section:
15.6.1
15.6.5
15.6.1
15.6.2
15.6.4
15.6.5
15.6.6
15.6.7
15.6.8
15.6.3
Creating Momentum for E
Resulting effect of increased competitiveness of green risk-return profiles
E
< 2°
F
Synergies between real econ. / fin. sect. regulation
F
E
> 3°
Appropriate consideration of physical and transition risk
Pricing of carbon externalities / regulative law
More key areas with catalitic effects to address barriers
Intl. Public climate finance
Consistent financial flows
Inconsistent financial flows
Net flows
Finance as: Enabler and Follower

Corrected Ch 15 Figure 15.3

Source (type)	2013	2014	2015	2016	2017	2018	2019	2020
UNFCCC SCF (total high)	687	584	680	681	Published after literature cut-off		n/a	n/a
Deflated to USD2015	*706*	*590*	*680*	*674*				
UNFCCC SCF (total low / CPI)	339	392	472	456	/608	/540	/623	/640
Deflated to USD2015	*349*	*396*	*472*	*451*	*/590*	*/513*	*/581*	*/590*

Note: Standing Committee on Finance (SCF). Numbers in current billion USD. Deflated to USD2015 in *italic*. Given the variations in numbers reported by different entities, changes in data, definitions and methodologies over time, there is low confidence attached to the aggregate numbers presented here. The higher bound reported in the SCF's Biennial Assessment reports includes estimates from the International Energy Agency on energy efficiency investments, which are excludes from the lower bound and CPI's estimates. Source: UNFCCC 2018a; Buchner et al. 2019; Naran et al. 2021.

Table 15.1: Total climate finance flows between 2013 and 2020



Type of Economy **Sector**

Note: Numbers in current billion USD. Deflated values see Table 15.1 in *italic*. Type of Economy figure (left): Type of Economy (R3) based on official UN country classification. "0" no regional mapping information available. Sectorial figure (right): *Policy*, incl. "Disaster Risk Management"; "Policy and national budget support & capacity building". *Transport*, incl. "Sustainable/Low Carbon Transport". Energy Efficiency, incl. "Industry, Extractive Industries, Manufacturing & Trade", "Low-carbon technologies", "Information and Communications Technology", "Buildings & Infrastructure". *Electricity*, incl. "Renewable energy generation", "Infrastructure, energy and other built environment", "Transmission and distribution systems", and "Energy Systems". *No sector*: no sector information available, or neglegting flows. *Other*, incl. "Non-energy GHG reductions", "Coastal protection". Source: Own calculations, based on (Naran et al. 2021).

Figure 15.3: Available estimates of global climate finance between 2014 and 2020

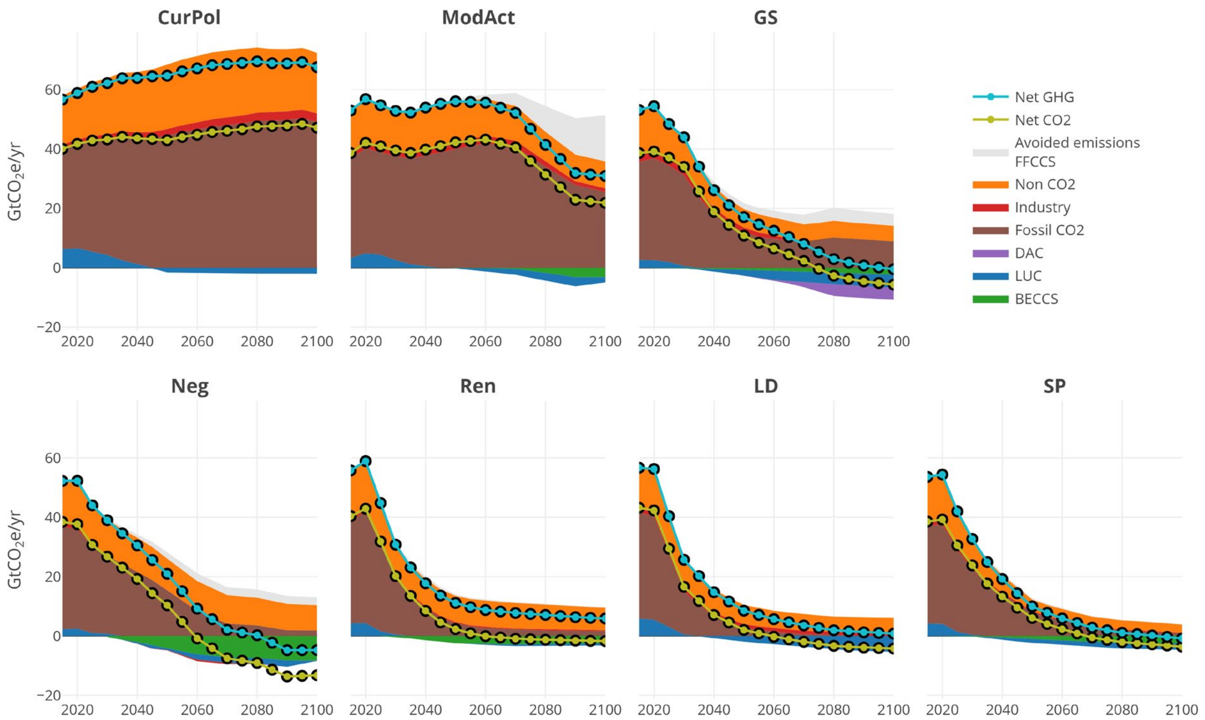
Corrected Table 15.4

Sector	Studies	Global ranges tr USD yr^{-1} - *Confidence Level*		Regional breakdown		Comment
Energy	IAM database, SEforAll (SEforALL and CPI 2020), IRENA 1.5-S and TES scenarios (IRENA 2021), IEA SDS and NZE scenarios (IEA 2021b)	0.8-1.5	*High confidence*	Detailed breakdown for R10 possible for IAM database and applied to the derived range	*Medium confidence*	Wide ranges primarily driven by varying assumptions with regard to grid investments relating to the increased RE penetration.
Energy Efficiency	IRENA 1.5-S and TES scenarios, IEA SDS and NZE scenarios	0.5-1.7	*Medium confidence*	Adjustments required to regional categorization by IEA and IRENA	*Low-medium confidence*	Medium confidence levels due to missing transparency with regard to underlying assumptions on technology costs. Low-to-medium confidence level on regional allocations due to required adjustments.
Transport	OECD/IEA (OECD 2017b) and Oxford Economics (Oxford Economics 2017) on rail investment data, IRENA 1.5-S and TES scenarios, IEA SDS and NZE scenarios for transport (energy efficiency) and electrification	1.0-1.1	*Medium confidence*	Adjustments required to regional categorization by IEA and IRENA	*Low-medium confidence*	Needs including battery costs, not total costs, of EVs, likely underestimation of needs due to missing data points on rail infrastructure.
AFOLU	Chapter 7 analysis, Section 7.4; The Food and Land use Coalition (Shakhovskoy et al. 2019)	0.1-0.3	*High confidence*	Breakdown for R10 possible for chapter 7 analysis	*Medium confidence*	Upper end of range incl. opportunity costs as these likely increase costs of investment of land.

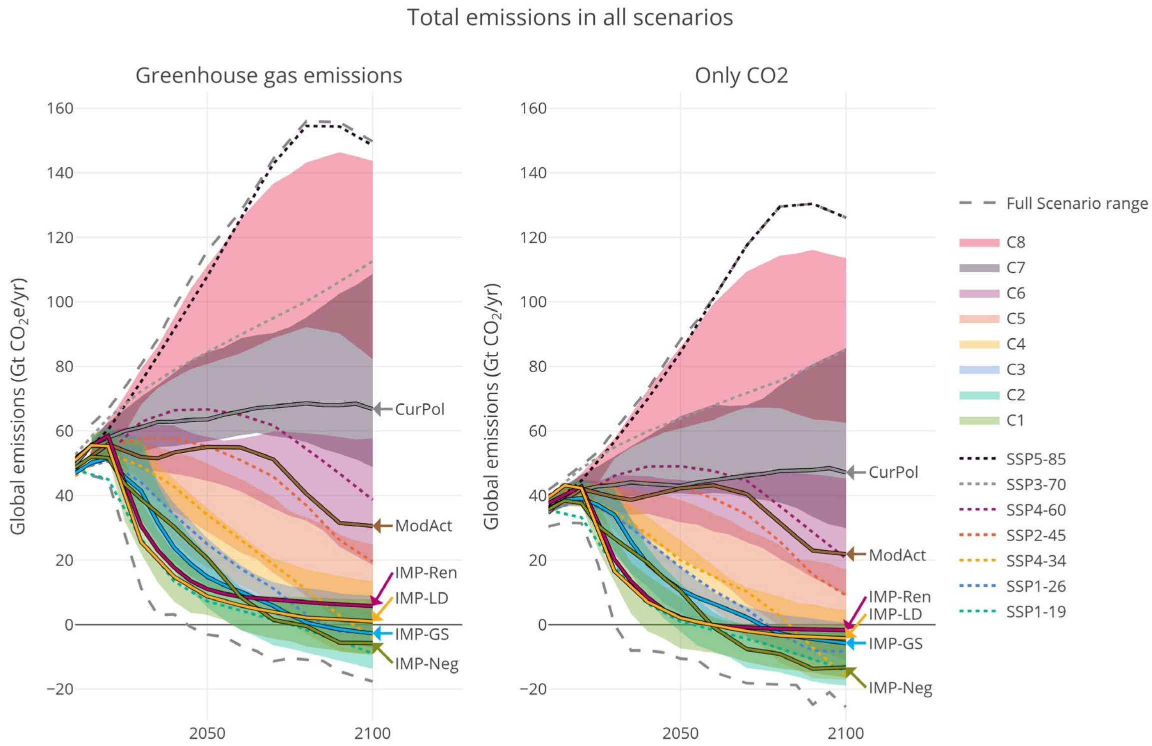
Corrected table 15.3

C3	4 [78]	20 [106]	22 [92]	9 [107]	9 [85]	4 [78]	29 [81]	1 [90]	0 [78]	9 [83]
(Range)	(~~Range~~0;6)	(~~Range~~1;33)	(~~Range~~3;41)	(~~Range~~1;21)	(~~Range~~0;13)	(~~Range~~0;9)	(~~Range~~2;42)	(~~Range~~0;2)	(~~Range~~0;1)	(~~Range~~0;16)

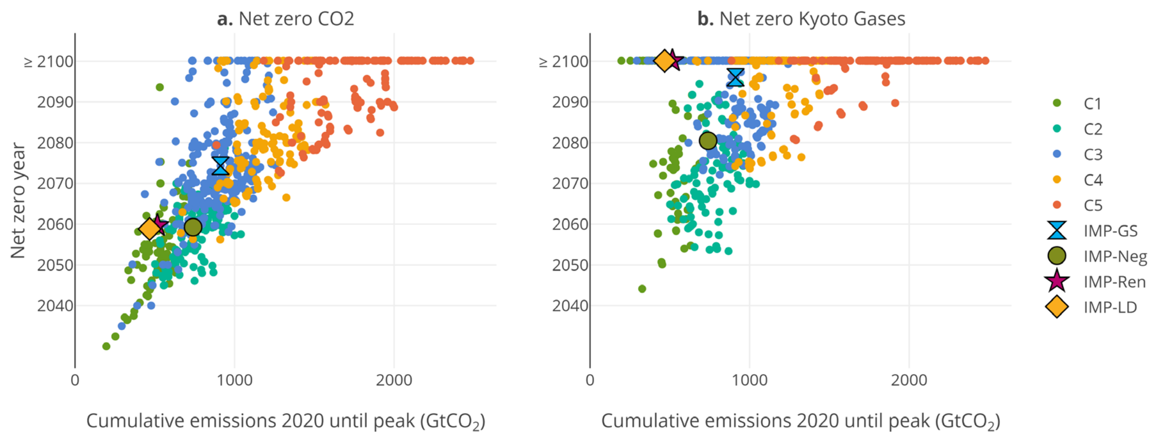
Corrected Fig 3.7



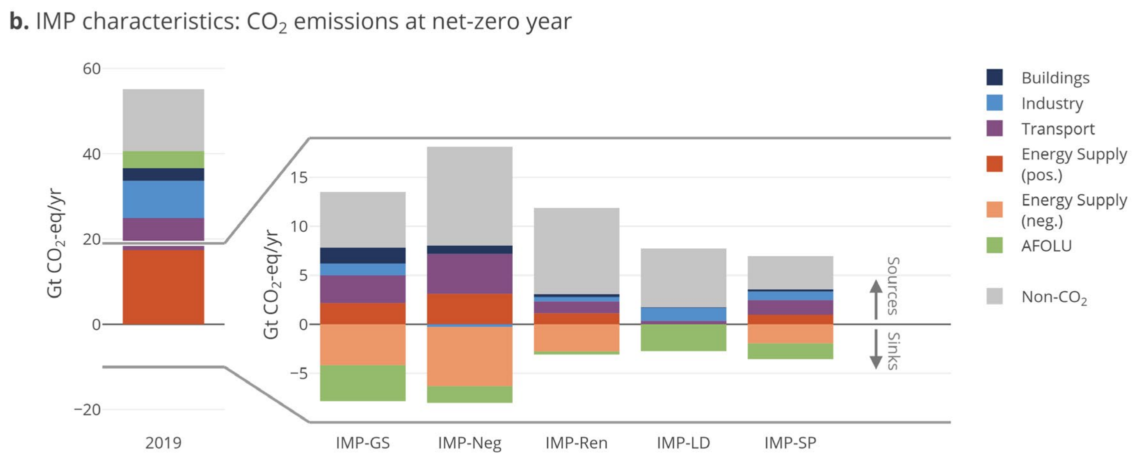
Corrected Fig 3.10



Corrected Fig 3.14

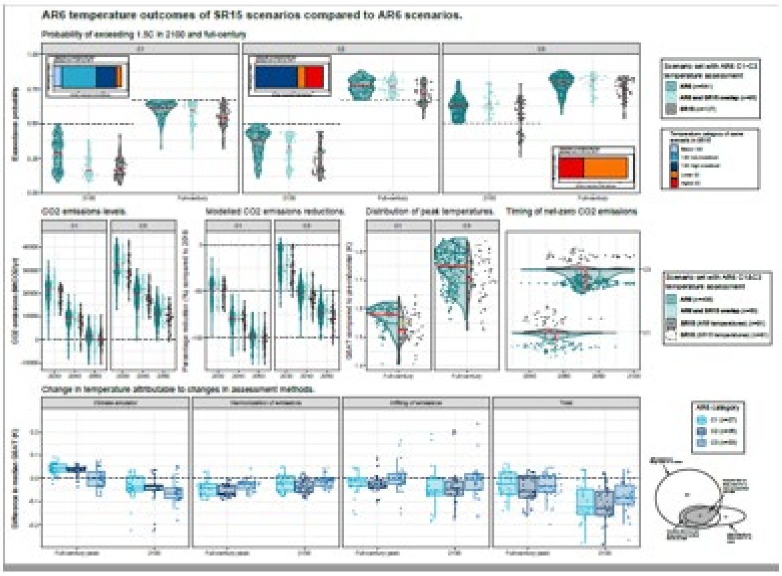


Corrected Fig 3.16b

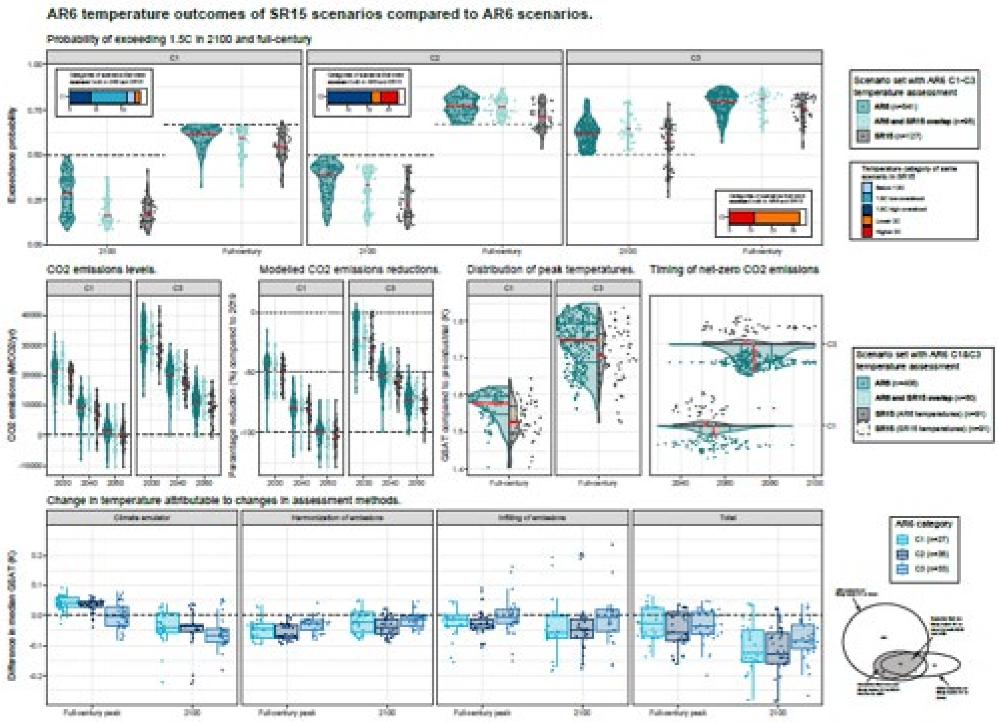


Corrected Annex II Fig II.3

OLD:



NEW:



Corrected ANNEX II Table 1

Table: 1 | Classification schemes for countries and areas

WGIII AR6	
High Level (6)	**Low-level (10)**
Developed Countries (DEV)	North America
	Europe
	Australia, Japan and New Zealand
Eastern Europe and West-Central Asia (EEA)	Eastern Europe and West-Central Asia
Latin America and Caribbean (LAM)	Latin America and Caribbean
Africa (AF)	Africa
Middle East (ME)	Middle East
Asia and Pacific (APC)	Eastern Asia
	Southern Asia
	South-East Asia and Pacific
International Shipping and Aviation	