INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

WMO UNEP

IPCC Fourth Assessment Report

Expert Review of the Second-Order Draft

Technical Summary
incl TSU responses on general comments – 8 Oct 06

LA4 authors -please note:

-This document, contains for your convenience draft responses from the TSU to general comments to the TS as a whole, and to the general comments to the individual sections.
- From these general comments, you find below some issues that need your specific attention
- You are requested to respond to the specific comments to the invidual sections, using this document in electronic Word version.
- *Please specify your chapter number here: ---*

Batch A & B combined (September 29, 2006).

Review issues that need specific attention

- **Please note:** the first 6 comments of the TS are wrongly numbered: TS-1 A to TS – 6 A. They are here marked them with an extra (*) to discern them from the comments that follow starting again with TS-1A

- ***ALL/CHAPTER 11***: TS -4 A. Shall we indeed add a table with total mitigation potential over main 'technologies' (efficiency, fuel switch, re, biomass, nucl, CCS) for 2030, like we have for 2100 (table TS- 16) – if possible ?

- ***ALL*** TS-7 A:. TS would need a section on gaps in knowledge. Do we need to address 'robust findings'as suggested by Andy Reisinger?

- ***ALL*:** Several expts/ govts find the TS too long: TS-1A, TS-10A, TS-23A, TS -54A. Section 1 and 3 are relatively long – they may be shortened

- ***ALL*:** Do we need references in TS to corresponding sections in main chapters as suggested ia in TS-6A, TS -24A? or at least to tables and figures?.NB We did not do so in TAR and SR CCS – TSU will check with WG II and WG I what they do

- ***ALL:*** Confidence / uncertainty/likelihood /non-permanence statements are missing. (TS 17 A., TS-48A, TS 1101A, TS 1214A, TS 1232A, TS 1333A). This is general problem for the TS as well as for the individual chapters. They should be introduced where possible. The SPM should be consistent with the chapters and TS in this respect

- ***CHAPTER 11***: TS-22 A: consolidation of AM sections: this should be done in chapter 11

- ***C&P BREAKOUT GROUP*/CH 11**: TS-35A, TS- 39A: US says: many mitigation options to 2030 are already in baselines hence underestimation of reduction costs and overestimation of mitigation potential. . See also: TS-41A referring to table SPM-2 / TS-19. US: the costs/potentials table would be 'seriously flawed' because 'no. consistent modeling framework using a common baseline that takes into account economic interactions between sectors'. See also: TS-53 A: show top-down mitigation potentials on a sectoral level. **Essential to the credibility of the WG3 AR4.**

- ***ALL:*** TS-43A, TS 1273: the TS does not describe progress since TAR nor does it compare cost/ mitigation data with TAR. Yes this would improve the chapters and TS but how to handle that?

- ***TECHNOLOGY BREAKOUT GROUP*** TS – 44A, TS -46A seem to express the US govt view on technology rather than a balanced summary of what is in the report, – suggested to reject but they deserve discussion

- : TS- 703 A: make structure of under-sections in TS sections on ch 4-10 more uniform
- ***CHAPTERS 4-11*** TS-53 A: show top-down mitigation potentials on a sectoral level – is this doable?

- ***CHAPTER 1, CH 5, 7, 8:*** TS- 838A, TS- 1103A, TS-1188A, TS-1194A: inconsistencies between Fig. TS.2 page 3 and numbers in chapters 5,7,8

- ***CHAPTERS 8, 9, 11:*** check consistency with WG I and SPM figures ; TS 1193A, 1243A, 1248A, 1328A, 1365A

- ***CH 8:*** TS – 1179A use 'projections' instead of 'forecast'

- ***CH 9:*** peat soils and permafrost missing (TS -1231A)

- ***ALL:*** TS -1334A: give reduction potentials as a percentage of its corresponding emissions ?

- ***CH 8/9:*** TS- 1197A: address overlaps/gaps between ch 8/9

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-8	A	0	0	0	0	Why is the activities in the CDM only covered in the waste section: The information on the number of CDM project for all types can be updated using table 2, table 9, chart 1, and chart 2 in the "Analysis" sheet in the "UNEP Risoe CDM/JI Pipeline" published monthly on the www.cd4cdm.org web site at the address: www.cd4cdm.org/Publications/CDMpipeline.xls (Jørgen Fenhann, Risø)	Accept. CH10 say "*Need to coordinate through TSU where CDM is going to be addressed in the larger report*".
TS-345	A	10	9	0	0	"general development issues" - should be defined, otherwise the understanding of the context is difficult. From lines 8-10 0n p. 11 one can realize that the discussion is to be laid out in the context of MDGs. See also my 000 comment above. (VOLODYMYR DEMKINE, UNEP)	
TS-346	A	10	10	10	11	delete: …development….greenhouse gases. (0 0, IPCC TSU WGIII)	
TS-347	A	10	16	0	0	delete sentence (0 0, IPCC TSU WGIII)	
TS-348	A	10	18	0	0	Section 2. Framing issues is extremely long and wordy. It can be shorten substantially without loosing its essence. This is also consequence that chapter 2 is patchy in content and poorly written and structured. (Government of Spain)	
TS-349	A	10	19	10	19	Insert "These impacts can be" before "positive" (Rachel Warren, University of East Anglia)	
TS-350	A	10	23	10	23	Text flows better if delete 'nevertheless'. (Government of Australia)	
TS-351	A	10	26	0	0	FigTS7: change climate change (upper ellips left) into Interference with the Climate System (as is used in Article 2); add (crossing orange arrow left): Adaptation (see for instance Crutzens suggestion) (0 0, IPCC TSU WGIII)	
TS-352	A	10	26	0	0	"Figure 1.1" and "SPM - 1" appearing at top of Figure TS.7 may be removed. Also the old caption of this figure may be deleted. (Government of Pakistan)	
TS-353	A	11	7	11	8	It is proposed to substitute "derived" by "develeoped". (Government of Austria)	
TS-354	A	11	8	11	8	"this report" expand (as this is the TS) (Rachel Warren, University of East Anglia)	
TS-355	A	11	12	11	17	This list lacks key variables, such as respect for intellectual property and private property, contract rights, and rule of law. U.S. Government	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of U.S. Department of State)	
TS-356	A	11	13	11	17	Why limit this only to environmental taxes and regulations? Suggest striking "environmental". U.S. Government (Government of U.S. Department of State)	
TS-357	A	11	23	0	0	insert after detail: A more comprehensive and integrated approach can enhance sustainable development, in the meantime impacting the level of GHG emissions and mit. & adaptive capacity. (0 0, IPCC TSU WGIII)	
TS-358	A	11	28	0	31	"As far as international governance is concerned, a wider spectrum of stakeholders is beginning to be engaged. These stakeholders include international agencies, global forums like the WSSD, private companies, and NGO's." 1) What does "international governance" mean in this context? 2) As far as I am concerned the stakeholders listed have been engaged from the very beginning, not "beginning to be engaged" now. At least the most important ones… (VOLODYMYR DEMKINE, UNEP)	
TS-359	A	11	28	11	30	Is it correct for stakeholders to be referred as taking part in "international governance"? Please add "business associations" to be list. (Nick Campbell, ARKEMA SA)	
TS-360	A	11	29	11	29	add WSSD to the abbreviations list (Government of The Netherlands)	
TS-361	A	11	32	11	32	Editorial-Delete 'An' (i.e. 'Emerging literature….'). (Government of Australia)	
TS-362	A	11	33	11	38	It is suggested to include a reference to the appropriate chapter of the full reportr of WG III in order to help the reader identify the "emerging literature" mentioned in this paragraph. (Government of Austria)	
TS-363	A	11	34	11	38	delete two sentences (0 0, IPCC TSU WGIII)	
TS-1517	A	11	34	0	0	"Several authors have suggested that sustainable development can be addressed as a framework for jointly assessing social, human, environmental and economic dimensions." – Please edit. Sustainable development MUST "be addressed as a framework for jointly assessing social, human, environmental and economic dimensions". This is an overall consensus, not a "sevearal authors'" suggesteion. (VOLODYMYR DEMKINE, UNEP)	
TS-	A	11	40	11	40	Mitigation, vulnerability and adaptation relationships. See also WG II Chapter 17	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
364						Assessment of Adaptation Practices, Options, Constraints and Capacities. With important discussion on examples and links between adaptation and mitigation. There is an overlap with 3.5, P. 31 "Interaction between mitigation and adaptation". I suggest to re- write 2.2 including important contributions from 3.5. like: P.31, r. 29-30 "Recent assessments of the interactions between these alternative response policies indicate that they are complementary rather than alternatives" (Juan F Llanes-Regueiro, Havana University)	
TS-365	A	11	40	0	0	nothing about vulnerability here, so title should read: Mitigation and adaptation capacities and policies (0 0, IPCC TSU WGIII)	
TS-366	A	11	42	0	0	insert substitutable after complementary (as in line 21, page 9) (0 0, IPCC TSU WGIII)	
TS-367	A	11	42	11	44	This paragraph is correct. However, similar information has already been included on page 9, lines 20 to 36. (Government of Austria)	
TS-368	A	11	42	11	44	this para is fully covered by the proposed text for TS-9, 20-36 and may therefore be deleted (Government of The Netherlands)	
TS-369	A	11	47	12	1	very difficult sentences, suggest to rephrase "The responses ... capacities." to "A society's response to climate change (adaptation and mitigation, domestic and international) depends on the one hand on it's possibilities to take adequate measures, which is determined by technical reduction potential, human and financial resources, governance and institutional arrangements, as well as on its values concerning taking responsibility for other people and future generations. On the other hand it depends on the impacts and risks experienced and expected, both domestically and elsewhere in the world." (Government of The Netherlands)	
TS-370	A	12	2	12	4	leave out Policies……assessed. (0 0, IPCC TSU WGIII)	
TS-371	A	12	8	12	15	It is noted that the sentence starting with "Key factors determining .." has been repeated. It is proposed to delete lines 13 to 15 on that page. (Government of Austria)	
TS-372	A	12	11	12	15	delete lines 11,13, 14, 15 (0 0, IPCC TSU WGIII)	
TS-373	A	12	13	12	15	comment: this para is identical to TS-12, 8-11, delete (Government of The Netherlands)	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-374	A	12	17	13	11	Section 2.3 is very weak. First, we need a paragraph about the perception of the climate change issue as a risk problem. For example: 'Anthropogenic climate change in itself is a phenomenon, subjected to a certain probability, because of chaotic components in the climate system'. Then, splitting up this risk problem into the risk associated with climate change, impacts and adaptation/mitigation. This is very important in light of 'decisionmaking under uncertainty' (precautionary principle!). Insert Page 37, Lines 7-19 here. In the considerations, no attention is being paid to the role of sensitivity analysis, and calibration & validation, in reducing the uncertainties! Maybe the IPCC Workshop report from May, 2004 can be used to provide some sound text here. The Section should result in some sort of guidance how the concept has been used in the report. (0 0, IPCC TSU WGIII)	
TS-375	A	12	17	13	12	The discussion of the treatment of risk and uncertainty is helpful in the broader context of the framing issues that impact upon climate change decision making, however, as it then tries to set out the treatment of uncertainty in the WG3 report it becomes confusing. The authors should separate the general discussion of uncertainty, from the way it is treated in the WG3 report. The WG2 TS used a discrete box to deal with the characterisation of uncertainty under the AR4, and the WG3 authors should consider using a similar device. (Government of Australia)	
TS-376	A	12	19	12	20	It is suggested to revisit the explanation of "unceretainty". It is unclear, the language does not flow properly and the explanation does not match IPCC terminology. (Government of Austria)	
TS-377	A	12	22	12	22	"TS Table.1" should be changed to "Table TS.1" (Government of Pakistan)	
TS-378	A	12	29	12	40	Risk management should also take into account that the selection of appropriate adaptation measures needs to also take into account the nature of the adaptation measure ie contribution to ghg emissions. (Government of Australia)	
TS-379	A	12	30	12	0	In Table TS.1 the term "Value uncertainty" in the left column could be expressed more accurately as "Uncertainty of the numerical value of the model parameter". (Government of Finland)	
TS-380	A	12	32	0	0	Text presented under column 1 of Table TS.1 needs to be reformatted. (Government of Pakistan)	
TS-	A	13	2	13	12	add a description when levels of confidence are expressed, when likelihoods and	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
381						when such expressions are not given (Government of The Netherlands)	
TS-382	A	13	3	13	3	"uncertainy" should be corrected to read "uncertainty". (Government of Pakistan)	
TS-383	A	13	3	13	3	Strike “above” and insert “below”. U.S. Government (Government of U.S. Department of State)	
TS-384	A	13	5	13	12	The notion of high agreement, limited evidence appears to have been translated in the SPM to high confidence, limited evidence, which as noted in SPM is problematic. U.S. Government (Government of U.S. Department of State)	
TS-385	A	13	7	13	10	Table TS.2: It is proposed to substitute the caption of the y-axis as follows: Agreement or level of consensus. In addition the arrow should run parallel to the y-axis but not parallel to the x-axis. (Government of Austria)	
TS-386	A	13	7	13	10	Table TS.2 should be rewrite as its current version is not sufficiently clear. In this version table is not needed. (Government of Czech Republic)	
TS-387	A	13	8	0	0	Table TS2 see remark no 2 above about label of 33-66% probability class (Ronald Hutjes, Alterra)	
TS-388	A	13	8	13	9	It would be useful to introduce the abbreviations HM for High agreement, much evidence; HL for High agreement, limited evidence, etc in this table, since they have been used in the SPM. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-389	A	13	8	13	10	Table TS.2: Is it possible to define what constitutes 'limited' and 'much' evidence? (Government of Australia)	
TS-390	A	13	8	13	9	It would be useful to introduce the abbreviations HM for High agreement, much evidence; HL for High agreement, limited evidence, etc in this table, since they have been used in the SPM. U.S. Government (Government of U.S. Department of State)	
TS-391	A	13	10	13	15	Lower part of the Table TS.2 describing uncertainties does not correspond to legend in table TS.6 on pg.33 (Government of Czech Republic)	
TS-392	A	13	12	14	15	Chapter 2.4 is verxy much appreciated. Because decision making approaches cannot escape dealing with values the IPCC should avoid being prescriptive but provide policy relevant information only.	

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						(Government of Austria)	
TS-393	A	13	14	14	3	both above and below the bullets (different) caveats are given; please reformulate (Government of The Netherlands)	
TS-394	A	13	18	0	0	Ethical?? No coverage with the accompanying text (0 0, IPCC TSU WGIII)	
TS-395	A	14	15	14	15	The following wording is suggested: "Decisions on climate change …. (Government of Austria)	
TS-396	A	14	17	14	17	The following wording is proposed: .. As well as for the distribution ... (Government of Austria)	
TS-397	A	14	18	0	0	Figure TS.3 is unclear and can't be read. (Katherine Casey Delhotal, Research Trinagle Institute)	
TS-398	A	14	18	14	20	Table TS.3, second column, third row: It is suggested to substitute "sections" by "people". (Government of Austria)	
TS-399	A	14	18	14	20	In Table TS.3 "health" should be change for "human well being" as described climate change effects are not closely related to the typical health issues (Government of Czech Republic)	
TS-400	A	14	19	15	3	table TS.3, comment: we are hesitant to edit existing language, but some of this table could be improved such as column 3, row 3 replace "With greater negative impacts in developing countries inequality will increase" by "greater negative impacts in developing countries", column 2, row 4, replace "Poorer people suffer from lower general health standards and less access to health services" to "poorer people generally have less access to health services", column 3, row 4, replace "major impacts of flooding, vector borne diseases etc. will be in developing countries", by "larger impacts of flooding, vector borne diseases etc. in developing countries", column 2, row 6, replace "As major users of natural resouces e.g. firewood for wood fuel and as contributers to subsistence agriculture," to "As major users of natural resouces e.g. firewood and as being highly dependent on subsistence agriculture," (Government of The Netherlands)	
TS-401	A	14	19	0	0	Delete the old caption of Table TS.3. (Government of Pakistan)	
TS-402	A	14	20	15	3	Table 2.7.3 needs some adjustment as the text is blurred and some footnote to the Table is not completely readable. (Muhammad Latif, Applied Systems Analysis Group)	

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TS-403	A	15	0	15	4	Table TS.3, third column, sixth row: The following language is proposed: Costs of adaptation in terms of percentage of GDP will be greater …. (Government of Austria)	
TS-404	A	15	0	15	4	Table TS.3, third column, seventh row: The following wording is proposed: Effects of migration could be felt in all countries. (Government of Austria)	
TS-405	A	15	1	15	3	It is not intuitively obvious, at least to this reviewer, why climate change will increase economic disparity between genders across country lines. Some explanation should be added. Also, the phrase "Cuts in government expenditures to cope with climate change …" is unclear. It appears to mean cuts in government expenditures for activities other than coping with climate change. If this is the case, the wording needs to be made explicit. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-406	A	15	1	15	5	What are rationals for line "Gender" in Table TS.3? - do really women are more affected by climate change - reference or reconsidering is needed (Government of Czech Republic)	
TS-407	A	15	1	15	3	It is not intuitively obvious, at least to this reviewer, why climate change will increase economic disparity between genders across country lines. Some explanation should be added. Also, the phrase "Cuts in government expenditures to cope with climate change …" is unclear. It appears to mean cuts in government expenditures for activities other than coping with climate change. If this is the case, the wording needs to be made explicit. U.S. Government (Government of U.S. Department of State)	
TS-408	A	15	11	15	11	The following wording is proposed: .., but this can also be interpreted as ensuring that …. (Government of Austria)	
TS-409	A	15	11	15	11	The phrase "can be" appearing after the phrase "but can also be" may be deleted. (Government of Pakistan)	
TS-410	A	15	16	15	17	This statement should mean that assumptions must appear in the texts of the SPM and TS whenever such costs and benefit data appear. (Nick Campbell, ARKEMA SA)	
TS-411	A	15	16	15	17	Specify or leave out (0 0, IPCC TSU WGIII)	
TS-412	A	15	16	15	20	The sentence "The calculations ….. assumptions used" is repeated in this paragraph. (Government of Pakistan)	

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TS-413	A	15	19	15	21	It is proposed to delete the sentence: The calculation of costs and impacts of climate change … because this information is already included in the first sentence of this paragraph. (Government of Austria)	
TS-414	A	15	26	15	34	This is in a different style to the previous two points and could be shorter. E.g. "discount rate: is the discount rate constant or decreasing over time" - then perhaps some reasoning (Government of UK)	
TS-415	A	15	33	15	33	The following wording is proposed: .. By some governments including ... (Government of Austria)	
TS-416	A	15	33	15	33	"Government" should be replaced by "Governments". (Government of Pakistan)	
TS-417	A	16	4	16	14	Suggest redrafting and reordering: Ancillary or co-impacts, no-regret options, and double dividends Ancillary or co-impacts. Policies aimed at mitigating GHGs can yield other indirect social benefits or costs. Similarly, other policies can yield some benefits and cost for GHG mitigation. Policies with multiple objectives can have co-benefits and co-impacts. No-regrets. Negative cost options – where the benefits, including co-benefits, of implementing the options are greater than the costs – are commonly referred to as no-regrets options. Many project-level and sectoral mitigation costing studies have identified a potential of GHG reduction options with a negative cost. They depend strongly on assumptions regarding market efficiency. (Government of UK)	
TS-418	A	16	20	16	38	The definitions employed for market, economic and technical potential need to be used consistently throughout the report, however, obviously due to literature constraints this is not always possible. The authors, therefore need to insert a ensure that where such potentials do not match the IPCC definition that this is noted in the text. (Government of Australia)	
TS-419	A	16	20	16	38	to have clear definitions for the different potentials is very uselful. However, in chapter 9 page 30-31 there are also definitions as well in chapter 9 page 2 and 3 (the term biological potential is used): make defintions in TS in number and content consistent whith those in chapter 9. (Government of German Federal Environment Ministry)	
TS-	A	16	21	16	23	as "potential" seems to be the generic term for the special potentials listed below	

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420						the words in line 22 beginning with "with a given…." till ".. avoided" should be deleted. Otherwise the technical potential and physical potential are not a subspecies of the generic term "potential". (Government of German Federal Environment Ministry)	
TS-421	A	16	23	16	23	It would be useful for the authors to define a baseline/ reference case in the TS. (Government of Australia)	
TS-422	A	16	26	0	0	what are private unit costs? (0 0, IPCC TSU WGIII)	
TS-423	A	16	29	16	29	Suggest reword to explain that it is a cost-benefit analysis of the non-climate implications of the mitigation measure being considered (and thus does not include the avoided climate change damages) if this is true - otherwise I am not understanding correctly so suggest wording needs to be clearer. (Rachel Warren, University of East Anglia)	
TS-424	A	16	29	16	29	Can non-market social costs and benefits be defined? How are abatement costs reported throughout report defined? (Government of Australia)	
TS-425	A	16	34	16	38	The definition of "technical potential" is unclear, particuraly of the description of "only to "practical constraints" although in some cases implicit economic considerations are taken into account". The "technical potential" will be usually higher than "economic potential", but this unclear definition will allow that the "technical potential" is sometimes lower than "economic potential". This is also inconsistent with Figure TS 7 in TAR. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	
TS-426	A	16	35	16	35	Sectoral chapters use term 'technical potential' in a wider economic context than 'energy efficiency'. (Government of Australia)	
TS-427	A	16	42	16	43	comment: technology is not the only determinant for the reduction potential and the cost of mitigating climate change; we therefore suggest to insert ", although other developments such as growth in wealth and population are also highly important" (Government of The Netherlands)	
TS-428	A	16	44	16	44	replace "determines" by "influences" (Government of The Netherlands)	
TS-429	A	16	45	16	45	In this row a definition of technology is included: “Technology is the broad set of processes covering know-how, experience and equipment, used by humans to produce services and transform resources.”	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						I like it. But looking at the Glossary you have another accepted definition: Technology: The practical application of knowledge to achieve particular tasks that employs both technical artefacts (hardware, equipment) and (social) information ("software", know-how for production and use of artefacts). Why do we have a Glossary? (Juan F Llanes-Regueiro, Havana University)	
TS-430	A	16	45	0	0	replace processes by competences and tools (0 0, IPCC TSU WGIII)	
TS-431	A	17	0	0	0	Fig. TS.8 is incomprehensible basically because of graphical shortcomings. (Government of German Federal Environment Ministry)	
TS-432	A	17	5	17	7	This sentence mentions two technology deployments, but does not adequately distinguish between the two. The result is very confusing. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-433	A	17	5	17	7	delete Uncertainties….uncertainty"). (0 0, IPCC TSU WGIII)	
TS-434	A	17	5	17	7	It is suggested to revisit the sentence starting with: Uncertainties on … deployment rates dominates (delete s) over uncertainty in deployment of climate policy related technology. Much clearer is the language in brackets (baseline uncertainty, stabilisation uncertainty). However, stabilisation uncertainty seems to be too specific, because mitigation need not lead to stabilisation. (Government of Austria)	
TS-435	A	17	5	17	7	This sentence mentions two technology deployments, but does not adequately distinguish between the two. The result is very confusing. U.S. Government (Government of U.S. Department of State)	
TS-436	A	17	18	17	19	The following wording is proposed: Yet, the processes by which technologies are created, developed, deployed and eventually replaced are complex and no …. (Government of Austria)	
TS-437	A	17	19	17	19	comment: we miss a link to policies that can tackle the immaturity of the carbon market, suggest to add something like "policies may provide the longterm certainty that would provoke investments in technology development, in particularly when these are the implementation of an international agreement." (Government of The Netherlands)	
TS-438	A	17	19	17	24	comment: this sentence gives difficulty reading; we suggest to split it. (Government of The Netherlands)	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-439	A	17	19	17	24	Recommend breaking this sentence into two sentences. U.S. Government (Government of U.S. Department of State)	
TS-440	A	17	20	17	25	This section is hard to understand but seem to contain an important message. Please clarify. (Government of German Federal Environment Ministry)	
TS-441	A	17	25	0	0	figure TS.8 is not clear (Government of UK)	
TS-442	A	17	26	17	26	figure TS.8, comment: this figure seems corrupted, it should be identical to figure 2.5. (Government of The Netherlands)	
TS-443	A	17	26	17	26	figure TS.8, based on figure 2.5, we suggest to replace "Disembodied Technology (Knowledge)" by "theory", "Embodied Technology (plant, equipment, ...)" by "hardware (equipment, product)", to attach the funding arrows to the push, those by the public sector with the emphasis on basic R&D (thicker arrow to the left) and by the privat sector with emphasis on applied R&D and demonstration (thicker arrows to the right), to attach incentives/standards/regulations/subsidies/taxes and investments and market spillovers to pull, to start the pull arrow already in the basic R&D segment, but to make it broader towards the right, to rename the section "diffusion" to read "broad deployment" and the learning arrow is not easily understood in this context and we suggest to make a new figure showing the three drivers. (Government of The Netherlands)	
TS-444	A	17	27	0	0	Figure TS8 needs considerable improvement : the introduction of terms like "(dis)embodied" which are NOT used in the main text only add confusion (Ronald Hutjes, Alterra)	
TS-445	A	17	27	0	0	Figure TS.8 needs to be fixed. I can't read the labels on the arrows. (Katherine Casey Delhotal, Research Trinagle Institute)	
TS-446	A	17	27	17	32	Difficult to read it. (Juan F Llanes-Regueiro, Havana University)	
TS-447	A	17	27	0	0	FigTS8: delete this figures; is not very clear/not explained in the text. (0 0, IPCC TSU WGIII)	
TS-448	A	17	27	0	0	Figure TS.8 is not understandable. (Government of Spain)	
TS-449	A	17	28	17	0	Fig. TS8.This figure needs fixing. The version in Chapte 2 (p. 78) is fine and should be used. U.S. Government	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of U.S. Department of State)	
TS-450	A	17	31	17	31	It is proposed to substitute "discussion" by "discussing". (Government of Austria)	
TS-451	A	18	1	18	1	it may be unclear that "these two processes" refers back to "development" and "diffusion" (Government of The Netherlands)	
TS-452	A	18	2	18	0	It's not clear to what the "two processes" mentioned in this sentence refer. U.S. Government (Government of U.S. Department of State)	
TS-453	A	18	6	18	6	comment: this is a cryptic sentence, if it means what we think it does, it may be deleted (Government of The Netherlands)	
TS-454	A	18	8	19	1	comment: we need some text about push and pull and their additionality (Government of The Netherlands)	
TS-455	A	18	14	18	15	I would add geographical spillovers as transfer of knowledge and technology from the developed to the developing world is key for reducing emissions and adaptation. (Katherine Casey Delhotal, Research Trinagle Institute)	
TS-456	A	18	16	18	20	This is an excellent summary of an important conclusion. It should be highlighted more prominently than it has been. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-457	A	18	16	18	20	The sentence should not be part of the "bullet" paragraph (Government of Spain)	
TS-458	A	18	16	18	20	This is an excellent summary of an important conclusion. It should be highlighted more prominently than it has been. U.S. Government (Government of U.S. Department of State)	
TS-459	A	18	17	0	0	"R&D....spillovers" can be deleted (Government of Spain)	
TS-460	A	18	21	18	45	An example of where the TS could be reduced in size comes at page 21. The final four paragraphs are very discursive, and are appropriately discussed in the body of the WG3 report, however, go into two much detail for a Technical Summary. Suggest deletion of these paragraphs. (Government of Australia)	
TS-461	A	18	22	18	23	The following wording is proposed: They might be even higher with a stronger need for a broader suite of low carbon technology as required to achieve a lower	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						stabilisation target. (Government of Austria)	
TS-462	A	18	23	18	23	replace "current" by "common", "future" by "new" and "lower stabilisation target" by "higher carbon price" (Government of The Netherlands)	
TS-463	A	18	26	18	27	Is it actually an "irrefutable relationship" between technological advance (typically measured in per-unit costs) and cumulative production volume over time (the learning effect) or is this merely a consensus view? (Government of Australia)	
TS-464	A	18	33	18	33	add "Technology standards in regulations tend to lag years behind the technological frontier and by prescribing a particular technology, innovation may in practice be seriously hampered ." (Government of The Netherlands)	
TS-465	A	18	38	18	39	The following wording is proposed: … with technologies that today are very far from being economic viable in existing markets. (Government of Austria)	
TS-466	A	18	38	18	38	the subject "technology" is singular while the verb "are" is plural (Government of The Netherlands)	
TS-467	A	18	43	18	43	This is the first mention of the "Special Report" in this document. Clarify reference. (Government of UK)	
TS-468	A	18	43	18	44	rephrase to: "The main finding of the IPCC Special Report on Methodological and Technological Issues of Technology Transfer (2000) that a suitable enabling environment needs to be created in host and recipient country remains valid (see figure TS.9)." (Government of The Netherlands)	
TS-469	A	19	1	0	0	Fig. TS.9 can be deleted from the technical summary, it does not provide any substantial information (Government of Spain)	
TS-470	A	19	2	19	3	figure TS.9, comment: we are hesitant to suggest making changes in a figure taken from an other IPCC report, however, the figure remains rather theoretical, and it would be appreciated if factors could be specified based on section 2.8.3, such as for the host country environment human capacity, regulational framework, culture and acceptance, and investment power culd be examples (Government of The Netherlands)	
TS-	A	19	4	37	35	Chapter 3 is very much appreciated.	Noted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
471						(Government of Austria)	
TS-472	A	19	6	37	33	General Comment of Section 3: The authors use the terms “endogenous” and “exogenous” repeatedly without an explanation of what these terms mean. Not all the people reading this report are modelers. Please provide some context for the general reader and explain their importance (and do so in the appropriate place(s) in the report as well). U.S. Government (Government of U.S. Department of State)	Accept, terms to be added to the glossary
TS-473	A	19	6	37	33	Chapter 3 seems very detailed, technical and not easy to read for someone not familiar with the world of scenarios. It may be more helpful if reduced to the main messages. (Government of German Federal Environment Ministry)	Reject, the aim is to review the scenario literature but the text is being shortened and simplified
TS-45	B	19	6	0	0	General Comment of Section 3: The authors use the terms “endogenous” and “exogenous” repeatedly without an explanation of what these terms mean. Not all the people reading this report are modelers. Please provide some context for the general reader and explain their importance (and do so in the appropriate place(s) in the report as well). U.S. Government (Government of U.S. Department of State)	See TS-472A
TS-474	A	19	8	37	35	The authors should carefully consider whether the scenario figures that include numerous lines coupled with a range and median are helpful. For the audience of the TS, (many of whom will not be statistical specialists) the range and median could be misleading and could encourage readers to draw probabilistic conclusions that are not warranted. While such figures may be useful in the body of the chapter, the authors should consider a different form of presentation, or should delete the "TAR and pre-TAR ranges" lines. Additionally more explanation of these figures is necessary (including the role of sensitivity analysis) to make it clear that they are only indicative in nature and cannot be used to make probabilistic determinations. (Government of Australia)	Accept, figures to be rationalised and further explanation to be given
TS-475	A	19	8	37	35	The analysis in Chapter 3 shows there may be an upward bias among the scenarios in the population growth assumptions and the economic growth assumptions. This may in turn lead to some upward bias in the projections of emissions of greenhouse gases and most likely estimates of temperature increase. The authors should note the possibility of this upward bias in the TS, and that there have also been other changes in the most recent scientific studies that mitigate this bias. (Government of Australia)	Accept , text to be revised
TS-476	A	19	10	19	10	Clearly noting that the evolution of future greenhouse gas emissions is highly uncertain is very important and it is good that the authors have placed this	Noted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						statement prominently at the start of the section. (Government of Australia)	
TS-477	A	19	11	19	11	The following wording is suggested: (more than 750 emission scenarios) … (Government of Austria)	Accepted, text revised.
TS-478	A	19	11	19	11	It is not clear what means "more then 750 emissions" (Government of Czech Republic)	Noted, text revised.
TS-479	A	19	11	19	11	Authors should rephrase ("more than 750 emissions")? (Government of Australia)	Noted, text revised
TS-480	A	19	14	19	15	There is general acceptance that population projections are now much lower than they were previously yet as they have not been incorporated into new emissions scenarios they are not included in the AR4. This should be acknowledged by the authors. (Government of Australia)	Rejected, this is exactly the sentence in the taxt.
TS-481	A	19	18	19	18	add "and some that include aerosols aswell" (Government of The Netherlands)	Accepted. Text revised
TS-482	A	19	20	19	26	Move this para to Chapter 2 (Framing issues) (0 0, IPCC TSU WGIII)	Rejected. The text belongs here as it talks about mitigation policy and scenarios. Ch 2 is about framing issues.
TS-483	A	19	21	19	23	suggest redraft "The 80 IPCC TAR scenarios are examples of policy intervention and mitigation scenarios and the 40 SRES scenarios are examples of reference and baseline scenarios." (Government of UK)	Accepted. Text revised
TS-484	A	19	25	0	0	substitude "basket" by "collection " or "set" (Government of Spain)	Rejected. The term 'basket of gases' is used in the UN Framework Convention as well as in Kyoto Protocol. Moreover the suggested change does not alter the meaning.
TS-485	A	19	30	21	30	This piece of text can be radically shortened! Just leave Fig. TS 12 and some sentences about population and economic growth. (0 0, IPCC TSU WGIII)	Accepted
TS-486	A	19	30	20	30	The demographic projections are characterized as having shifted since the TAR, but the only significant shifts appear to be in the tails. The suggestion on p. 19/line 30 that projections have shifted downward would appear to be overstated based on this simple statistical picture. U.S. Government (Government of U.S. Department of State)	Accepted. Main thing is changes in perception of population development.
TS-	A	19	32	19	34	Figure TS.10 appears to show a larger revision at the upper end of the range than at	Accepted. Reformulate.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
487						the lower end of the range, contradicting this statement. Not having exact numbers, it is not possible to calculation percentage change, which might justify the statement. Either correct the statement or amplify it to explain how the size of the revision is determined. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-488	A	19	32	19	34	Figure TS.10 appears to show a larger revision at the upper end of the range than at the lower end of the range, contradicting this statement. Not having exact numbers, it is not possible to calculation percentage change, which might justify the statement. Either correct the statement or amplify it to explain how the size of the revision is determined. U.S. Government (Government of U.S. Department of State)	Noted. FIg. Will be removed, ref TS 485
TS-46	B	19	32	19	34	Figure TS.10 appears to show a larger revision at the upper end of the range than at the lower end of the range, contradicting this statement. Not having exact numbers, it is not possible to calculation percentage change, which might justify the statement. Either correct the statement or amplify it to explain how the size of the revision is determined. U.S. Government (Government of U.S. Department of State)	Noted. FIg. Will be removed, ref TS 485
TS-489	A	20	0	20	7	figure TS.10: It is noted that the second bar (TAR and pre TAR non intervention) only includes 4 instead of 5 bars. (Government of Austria)	Noted. FIg. Will be removed, ref TS 485
TS-490	A	20	2	20	7	comment: on the post TAR bar six percentage indicators appear, four on the TAR and pre-TAR bar, while the explanations mentions five percentages, please correct (Government of The Netherlands)	Noted. FIg. Will be removed, ref TS 485
TS-491	A	20	15	20	20	box TS.1: It is proposed to delete the words "for new years". (Government of Austria)	Noted. FIg. Will be removed, ref TS 485
TS-492	A	20	16	0	0	Box TS.1. The concept of PPP should be introduced earlier in the text. Moving Box TS.1 closer to the beginning of this chapter to coincide with Figure TS.3 is suggested. (Government of Japan)	Noted. Box will be removed, ref TS 485
TS-493	A	20	16	20	30	Box TS 1: A number of comments in Box TS.1 could be misleading. First, there are no differences between the OECD and Eurostat PPPs. Their compilation is a joint exercise and the differences between the four are minimal. It is not a reason for not using PPPs. No-one would object if the World Bank numbers were used for example. So there is no real argument to support the lack of a single method or price index. This should be explained by the authors. (Government of Australia)	Noted. Box will be removed, ref TS 485

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-494	A	20	20	20	23	PPP is the better alternative to MER for welfare or real income comparison across regions is a debatable proposition. See Pant and Fisher (forthcoming in Energy Economics). (Government of Australia)	Noted. Box will be removed, ref TS 485
TS-495	A	21	4	21	4	insert "such as" before "more recent scenarios ..." (Government of The Netherlands)	Noted. Text will be removed, ref TS 485
TS-496	A	21	6	21	15	Concerning PPP, Purchasing Power Parities it is claimed in the TS p. 21 line 6-15 that it is difficult to see why the choice of metric should affect the final emission. It is a fact that there is uncertainty about the impact of using MER versus PPP. It is also a fact that there is a data problem if PPP is used, so most surveys are based on MER. However, there is no doubt that PPP would be a better option, and MER underestimates the purchasing power in especially poorer countries, thereby GDP growth and CO2-emissions are overestimated (as stated in chapter 3, p. 21-25). It seems therefore irrelevant to claim that it is difficult to see an impact, line 6-15 on page 21 ought to be deleted or rearticulated. The use of MER is likely to distort the distribution of global emissions and will distort the cost impact of the mitigation effort. Though facts of how big this distortionary impact is, cannot be found, it might be significant. This uncertainty and potential impact is very important and needs to be given a fair presentation in the TS. (Helle Juhler-Kristoffersen, Confederation of Danish Industries)	Noted. Text will be removed, ref TS 485
TS-497	A	21	7	21	15	It is suggested to substitute this para by the following wording: Between scientists there has been some debate about the pros and cons of MER and PPP based scenarios. It would be helpful to refer to the underlying chapter of the main report that should also include reference to the underlying literature. (Government of Austria)	Noted. Text will be removed, ref TS 485
TS-498	A	21	7	21	15	This paragraph shows a lack of understanding of the criticisms that have been made. The authors need to more transparently address the criticisms that have been raised concerning the SRES and note that there are valid technical concerns that have been raised. (Government of Australia)	Accepted
TS-499	A	21	14	21	15	Delete sentence, do not add anything relevant (Government of Spain)	Noted. Text will be removed, ref TS 485
TS-500	A	21	14	21	14	The word "of" should be inserted between "number" and "other". (Government of Pakistan)	Noted. Text will be removed, ref TS 485
TS-501	A	21	14	21	14	… a growing number "of" other … (missing of) (Government of Australia)	Noted. Text will be removed, ref TS 485

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-502	A	21	17	21	30	The arguments for not changing to lower economic growth scenarios appear weak, however, the authors should note that there have been no meaningful studies that lie outside the SRES range. As the report shows, the median has halved for post TAR economic growth scenarios. The 25%-75% percentile range appears to be 21-29 units compared with 21-73 units, similar ranges, (although not as extreme) appear with 5% and 95% percentile points. Yet reading the text without looking at the graph you would think there has not been much change in the economic growth scenarios (i.e. upper and lower limits unchanged). The authors need to review the use of this figure. The IPCC needs to avoid appearing to be over estimating the impacts of climate change. However, the authors should note that no meaningful studies have been produced that lie outside of the SRES range. (Government of Australia)	Noted. Text will be removed, ref TS 485
TS-503	A	21	17	24	7	It's not clear from the discussion how pre-TAR, TAR, and SRES are related. A larger point is that there needs to be some explanation of these and other models and how they fit together chronologically and conceptually. Don't assume the reader knows. A separate Box explaining all this (pre-TAR, TAR, post-TAR, SRES, EMF, IMCP, etc.) would be useful. (The discussion on page 19 is inadequate.) U.S. Government (Government of U.S. Department of State)	Noted. Text will be removed, ref TS 485
TS-504	A	21	19	21	19	The following wording is suggested: .., the median of the new scenarios is about half of the median in the pre-TAR scenario literature … (Government of Austria)	Accepted.
TS-505	A	21	25	0	0	FigTs11: A title is missing (0 0, IPCC TSU WGIII)	Accepted
TS-506	A	21	31	22	5	Clarify what are the most important factors in baseline scenarios that cause such a wide range of outputs and by how much? (Government of UK)	Noted. Fig will be removed, ref TS 485
TS-507	A	21	32	0	0	insert after of: energy-related and industrial (0 0, IPCC TSU WGIII)	Accepted. Key word: technology and population growth
TS-508	A	21	32	21	32	The following wording is suggested: The span of CO2 emissions in the year 2100 across baseline scenarios ... (Government of Austria)	Accepted
TS-47	B	21	32	0	0	Figure 3.32 This section sates: "Figure TS.12 shows that the scenario range has declined since the TAR. In particular, there seems to have been a downward shift on the high end, but this difference is due to only eight high-emissions scenarios in the pre-TAR literature that extend beyond 40 GtC by 2100." The upper range for	Accepted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						energy-related CO2 emissions in TS.12 shows a drop of about 31 GtC (from ≈69GtC to 38GtC). The TS dismisses the significance of this, alluding to the fact that only eight scenarios were responsible for the drop (which begs the question of whythese emission scenarioswere included in the TAR in the first place). If these scenarios no longer appear in the literature, as the TS suggests, this indicates that knowledge has improved and the range reported in the TAR was too large. The range has been reduced considerably, primarily from the upper end. This should be stated plainly, without obfuscation, here and in the appropriate place(s) in the body of the report. U.S. Government (Government of U.S. Department of State)	
TS-509	A	21	33	22	1	This section states: "Figure TS.12 shows that the scenario range has declined since the TAR. In particular, there seems to have been a downward shift on the high end, but this difference is due to only eight high-emissions scenarios in the pre-TAR literature that extend beyond 40 GtC by 2100." The upper range for energy-related CO2 emissions in TS.12 shows a drop of about 31 GtC (from ≈69GtC to 38GtC). The TS dismisses the significance of this, alluding to the fact that only eight scenarios were responsible for the drop (which begs the question of why they were included in the TAR in the first place). If these scenarios no longer appear in the literature, as the TS suggests, this indicates that our knowledge has improved and the range reported in the TAR was too large. The range has been reduced considerably, primarily from the upper end. This should be stated plainly, without obfuscation, here and in the appropriate place(s) in the body of the report. U.S. Government (Government of U.S. Department of State)	Rejected. The text states clearly what the situation is.
TS-48	B	21	33	22	1	This section sates: "Figure TS.12 shows that the scenario range has declined since the TAR. In particular, there seems to have been a downward shift on the high end, but this difference is due to only eight high-emissions scenarios in the pre-TAR literature that extend beyond 40 GtC by 2100." The upper range for energy-related CO2 emissions in TS.12 shows a drop of about 31 GtC (from ≈69GtC to 38GtC). The TS dismisses the significance of this, alluding to the fact that only eight scenarios were responsible for the drop (which begs the question of why these emission scenarios were included in the TAR in the first place). If these scenarios no longer appear in the literature, as the TS suggests, this indicates that knowledge has improved and the range reported in the TAR was too large. The range has been reduced considerably, primarily from the upper end. This should be stated plainly, without obfuscation, here and in the appropriate place(s) in the body of the report.	Rejected, cf TS-47

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						U.S. Government (Government of U.S. Department of State)	
TS-510	A	22	2	22	2	The following wording is suggested: .. But are not reported in the peer-reviewed literature ... (Government of Austria)	Rejected, cf TS-47
TS-511	A	22	2	22	2	typo, change "din" to "in" (Government of The Netherlands)	Accepted.
TS-512	A	22	2	22	2	"din" may be replaced by "in". (Government of Pakistan)	Accepted
TS-513	A	22	16	0	0	Here, it is relevant to know if the reason for the decline is mainly anthropogenic (e.g., reforestation) or mainly natural (assuming C-fertilization dominating increased respiration) or a combination (e.g., regrowth after agricultural yield increases and area contraction?). (Rob Swart, MNP)	Reject. Lines 18-22 on page 22 provide the exlpanation sought by the reviewer—attributing the changes to anthropogenic drivers.
TS-514	A	22	17	0	0	The statement of expert agreement suggests that experts can agree on a most likely future. Also, it would also apply to energy emissions, where this statement is not made. I suggest to drop it. (Rob Swart, MNP)	Taken into account. Disagree with criticism since recent scenarios are non-harmonized. Considering rephrasing: "Similarities in the trends of recent non-harmonized scenarios suggests a degree of expert agreement."
TS-515	A	23	0	23	0	Figure TS 13: In the right part, the bottom limit of the grey area appears as a red curve which induces confusion with the SRES curves. The color for so called A1and A2 is practically the same. Moreover, A1 should be corrected into A1B. (Government of France)	Accepted.
TS-516	A	23	3	23	3	For readers unfamiliar with the term, please explain "EMF-21" and its significance to the discussion. (The phrase "Energy Modelling Forum" doesn't appear until page 24, line 25.) Also, be consistent in how this is presented, i.e., "EMF-21" or "EMF21". (A similar format should be used for "EMF19".) U.S. Government (Government of U.S. Department of State)	Accepted.
TS-517	A	23	6	23	6	replace "as" by "than" (Rachel Warren, University of East Anglia)	Accepted.
TS-518	A	23	6	23	9	suggest redraft "Total emissions of non-CO2 GHG are projected to increase, but somewhat less rapidly than CO2 emissions. This results from agricultural activities growing less than energy use. This is because the most important sources of CH4 and N2O are agr. Including Fthe F-gases gives total non-CO2 emissions in the range X to Y in 2100." (Government of UK)	Accepted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-519	A	23	8	23	8	This is the first time the term “F-gas” appears in the report text. Please explain what an “F-gas” is for readers not familiar with the term. U.S. Government (Government of U.S. Department of State)	Accepted
TS-49	B	23	8	0	0	This is the first time the term “F-gas” appears in the report text. Please explain what an “F-gas” is for readers not familiar with the term. U.S. Government (Government of U.S. Department of State)	Accepted
TS-520	A	23	9	23	9	comment: this is the first time emissions are expressed in C in addition to CO2; this seems rather haphazardly; we suggest to delete "(2.7-9.2 Mt Ce)", and, if it is not yet included in the report, to add a small box explaining how to convert between these units (Government of The Netherlands)	Noted. Data will be converted into CO2 eq.
TS-521	A	23	9	23	9	comment: it is not clear that eq and e both express equivalents, we suggest to only use eq (Government of The Netherlands)	Noted. Data will be converted into CO2 eq.
TS-522	A	23	9	23	9	"Mt CE" at the end of the line may be replaced by "Mt Ceq". (Government of Pakistan)	Noted. Data will be converted into CO2 eq.
TS-523	A	23	10	23	10	Should tCe read tCeq? (Rachel Warren, University of East Anglia)	Noted. Data will be converted into CO2 eq.
TS-524	A	23	11	0	0	Define EMF here (it is defined first on next page (p24 line 25)) (Government of UK)	Noted. It is mentioned in Secion 3.1.
TS-525	A	23	11	24	4	comment: it is explained that for SO2 and NOx scenarios since the TAR have lower emission projections but as these are not in figure TS.13 it is unclear how significant this is if compared to the Kyoto-gases (Government of The Netherlands)	Taken into account – will clarify emission in TS.13.
TS-50	B	23	11	0	0	For readers unfamiliar with the term, please explain “EMF-21” and its significance to the discussion. (The phrase “Energy Modelling Forum” doesn’t appear until page 24, line 25.) Also, be consistent in how this is presented, i.e., “EMF-21” or “EMF21”. (A similar format should be used for “EMF19”.) U.S. Government (Government of U.S. Department of State)	Accepted.
TS-526	A	23	12	23	12	what is meant by "drivers"? (Rachel Warren, University of East Anglia)	Taken into account – will explain in Chapter..
TS-527	A	23	13	24	1	Figure TS 13 does not give data for SO2 and NOx. (Government of France)	See TS-525
TS-528	A	24	0	24	0	Box TS 2: It might be worth recalling here the timing issue developped on page 9, lines 2 to 19 which is more severe for CO2. WG 1 TS states page 41 that "If	Rejected. WG3 focuses on the use of GWPs for GHG comparison and aggregation. WG1

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						emissions were to cease in 2100, emissions that occurred in the 21st century are expected to continue to have an impact even at year 3000, when both surface temperature and sea level rise due to thermal expansion are still projected to be substantially higher than preindustrial." This is policy relevant and deserves being recalled in box 2. (Government of France)	TS comment not appropriate here.
TS-529	A	24	1	24	2	explain reason of this decrease (0 0, IPCC TSU WGIII)	See TS-525
TS-530	A	24	6	24	7	suggest redraft "The uncertainty, as represented by the ranges of main driving forces and emissions, is broadly similar when comparing SRES and new scenarios in the literature." (Government of UK)	Rejected – current text is appropriate.
TS-531	A	24	6	24	7	This statement is simply not correct and should be deleted. (Government of Australia)	Taken into account – will better clarify stement on ranges.
TS-532	A	24	6	24	7	This section states: "In general, the comparison of SRES and new scenarios in the literature shows that the uncertainties as represented by the ranges of main driving forces and emissions have not changed very much." By "new scenarios in the literature", what do you mean? Post-TAR? Not clear given the preceding discussion. Also, if by "the ranges of main driving forces" you are referring to population growth, figure TS.10 shows a drop in the upper range of population of about 4 billion (≈19 to 15)—nearly a quarter. Suggest inserting "some" between "of" and "main". U.S. Government (Government of U.S. Department of State)	Taken into account – will better clarify stement on ranges.
TS-51	B	24	6	24	7	This section states: "In general, the comparison of SRES and new scenarios in the literature shows that the uncertainties as represented by the ranges of main driving forces and emissions have not changed very much." By "new scenarios in the literature", what is meant? Post-TAR? Not clear given the preceding discussion. Also, if "the ranges of main driving forces" is referring to population growth, figure TS.10 shows a drop in the upper range of population of about 4 billion (≈19 to 15)—nearly a quarter. Suggest inserting "some" between "of" and "main". U.S. Government (Government of U.S. Department of State)	See TS-532
TS-533	A	24	9	0	0	Section 3.3. This section should include a brief reference to the information contained in WG1 about the carbon cycle feedbacks, and their impact on emissions required to achieve any given stabilisation level. It is not clear from the material presented in the TS and underlying chapter whether the stabilisation runs discussed	Taken into account – will clarify assumptions and impacts of carbon cycle feedbacks.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						here have included this more recent information on carbon cycle feedbacks. If they haven't, it would seem necessary to include a caveat to that extent both in the TS and underlying chapter, because the more recent information suggests that the feedbacks could substantially reduce the emission levels that are consistent with a given stabilisation target, especially for higher stabilisation levels, compared to values used in the TAR. (Andy Reisinger, TSU IPCC Synthesis Report)	
TS-534	A	24	11	24	20	In this paragraph the authors provide a discussion on different targets used in the mitigation literature, however, the authors provide no clear assessment of which approach is the most rigorous. If it is possible to have an assessment of this discussion in the literature it would be of benefit to policy readers. (Government of Australia)	Noted, reference to section 3.3.2 should be added here
TS-535	A	24	18	24	18	Though the advantage and disadvantage are mentioned for radioactive forcing target, when it comes to temperature target, only the advantage is described and no statement on disadvantage. In view of this, the disadvantage of temperature target should also be inserted here, for example "the disadvantage of temperature target is that it is rather difficult to set any concentration target because of the diversified views of climate sensitivity". (Mitsutsune Yamaguchi, Teikyo University)	Accepted, text on disadvatages from section 3.3.2 should be added here.
TS-536	A	24	20	24	25	box TS.2: The following wording is proposed: In multi gas studies .. (delete "a"). (Government of Austria)	Accepted
TS-537	A	24	20	24	25	box TS.2: The following wording is proposed: .. Trading between gases broadens …. (Government of Austria)	Accepted
TS-538	A	24	20	24	25	Why to specifically mention US climate policy in Box TS.2? - there are more other policies which should ne used as an example (Government of Czech Republic)	Rejected, reference to Kyoto given as well
TS-1522	A	24	20	24	25	Abbreviation for Global Warming Potencial shoul be corrected (Government of Czech Republic)	Accepted
TS-539	A	24	21	0	0	Box TS.2 - need to have the GWP abbreviation standardized. (Katherine Casey Delhotal, Research Trinagle Institute)	Accepted
TS-540	A	24	22	0	0	In Box TS.2, line nos. 8 and 11, please check if the word "metric" needs to be replaced by "matrix". (Government of Pakistan)	Rejected
TS-541	A	24	22	0	0	Box TS.2, Line 4: "GWp" should be replaced by "GWP". (Government of Pakistan)	Accepted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-542	A	24	24	24	24	The following wording is proposed: A large number of studies focusing on climate stabilization has been published since the TAR. (Government of Austria)	Accepted
TS-543	A	24	25	24	35	spelling of gases. What is meant by "optimal weights"? (Rachel Warren, University of East Anglia)	Accepted, spelling of gases Accepted, clarify
TS-544	A	24	30	25	2	This is very confusing. If global warming is viewed as less critical in the future than it is now then in the future you would not be aiming for the more stringent targets at short notice? Should it read more critical? Suggest replace with "the most economically efficient way to approach stringent targets is to focus on CO2 emission abatement initially and bring in abatement of short lived gases later. However if it is desirable to reduce the rate of warming currently or to avoid a near-term climate threhold then abatement of short lived gases is more important at an earlier stage" (Rachel Warren, University of East Anglia)	Accept, USE WORDING OF THE CHAPTER.
TS-545	A	25	0	25	0	footnote 3: It is suggested to include in footnote 3 the same information as in footnote 9 (see page 33 of TS). (Government of Austria)	Accepted
TS-546	A	25	4	25	12	For policymakers, category A is too broad as it includes scenarios ranging from "1.3 to 2.6 C" over preindustrial at equilibrium (see column 5). It is suggested to split this category into a new Cat A, that includes scenarios that aim at equilibrium temp. up to 2 C. The remaining scenarios should form a new Category B. The former categories B to E should become new categories C to F accordingly. The number of scenarios in this category (16 scenarios, see column 6) seems sufficient to allow for a split. The 2 C political target is supported by the EU, the transatlantic "International climate change task force (see report 'Meeting the Climate Challenge', Rt Hon. Stephen Byers MP and Sen. Olympia J Snowe, January 2005) and others. It is therefore highly important to have a corresponding scenario category to refer to in this latest IPCC assessment. Table TS.4 to be changed accordingly. (Government of German Federal Environment Ministry)	Accepted
TS-547	A	25	9	25	10	The following wording is proposed: It consists of mitigation scenarios that have a radiative forcing in 2100 above 6 W/m2 and CO2-only concentrations of above 660 ppm. (Government of Austria)	Accepted
TS-548	A	25	14	25	19	Table TS.4 characterizes the categories of mitigation scenarios differently than Table SPM.1, though both are talking about the set of 117 scenarios. The two	Accepted

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						tables should be made consistent. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-549	A	25	14	25	16	The authors need to provide information concerning how gases are combined and what weights are used to derive the CO2-e concentration figure. A reference also should be provided to the WG1 discussion of this. (Government of Australia)	Accepted, replace footnote 3 by footnote 9
TS-550	A	25	14	25	19	Table TS.4 characterizes the categories of mitigation scenarios differently than Table SPM.1, though both are talking about the set of 117 scenarios. The two tables should be made consistent. U.S. Government (Government of U.S. Department of State)	Accepted
TS-52	B	25	14	25	19	Table TS.4 characterizes the categories of mitigation scenarios differently than Table SPM.1, though both are talking about the set of 117 scenarios. The two tables should be made consistent. U.S. Government (Government of U.S. Department of State)	Accepted
TS-551	A	25	15	0	0	Clarify in the table that this is for 2100 (Government of UK)	Rejected, clarify that it is long-term
TS-552	A	25	16	25	16	comment: check consistency with table SPM.1; also it is unclear how in categories A and E top respectively bottom value radiative forcings and concentrations relate to the range in temperature changes in column 5 (Government of The Netherlands)	Accepted, add ranges for all columns
TS-553	A	25	21	25	21	change "show" to "assume" (Government of The Netherlands)	Rejected, this is not an assumption but a result of the models
TS-554	A	25	22	25	23	change "any specific" to "all" and "target requires" to "targets studied require" (Government of The Netherlands)	Taken into account, reword sentence to "achieving stabilization of concentrations or radiative forcing requires ..."
TS-555	A	25	25	25	26	the final sentence of this para duplicates part of the second sentence and is thus superfluous (Government of The Netherlands)	Accepted
TS-556	A	25	26	25	26	After 'zero.', insert: 'In most stabilisation scenarios, this reduction of emissions to very low levels takes place roughly during the period 2050 to 2100. It is important to note that it occurs whilst accompanied by continued economic development and growth in energy consumption: it is unlikely that this can be accomplished without very strong efforts to develop and deploy the new power technologies that can almost completely replace carbon-emitting technologies during the course of this century.' (Ian Cook, United Kingdom Atomic Energy Authority)	Taken into account, Add reference to table TS.5 for timing, and reference to Figure TS.16 for technology deployment

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-557	A	25	26	0	0	Add: "For median mitigation scenarios, it will be necessary to provide non-CO2-emitting primary power in the range of 150 EJ/year by 2050, 500 EJ/year by 2100 and over 1000 EJ/year during the next century, while limiting CO2-emitting power to a small fraction of this level. The total requirement over the period until 2200 is in the range of 100,000 EJ. To address this problem requires R&D to provide large-scale non-CO2-emitting energy resources that, in aggregate, are not limited in their fractional market penetration." [Copy corrected version of Table 4.3.1 here.] (Robert Goldston, Princeton Plasma Physics Laboratory)	Rejected, not supported by the literature
TS-558	A	25	28	0	0	mention the reason for this, probably more because of studies focusing on agreed long-term climate objectives (especially the 2 degree target of the EU), rather than that these low levels are now found to be more feasible. (Rob Swart, MNP)	Rejected, speculative. At the one hand it is true that it might be the case, on the other hand most models have extended their mitigation portfolio by new options (e.g., negative emissions technologies)
TS-559	A	26	3	26	3	figure TS.14, please add graph for category A scenarios, if necessary delete the E scenarios graph (Government of The Netherlands)	Accepted, show revised ranges for category A seperately
TS-560	A	26	5	26	5	Typo error. "(Category ! to E, see Table TS.4 Black lines give the projected CO2 emissions for hte recent" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted
TS-561	A	26	5	0	0	substitute "!" by "A" (Government of Spain)	Accepted
TS-562	A	26	5	26	5	there are two typos in this line, "!" and "hte" (Government of The Netherlands)	Accepted
TS-563	A	26	5	26	5	Check and correct the phrase "Category! to E". (Government of Pakistan)	Accepted
TS-564	A	26	5	26	5	"hte" may be replaced by "the". (Government of Pakistan)	Accepted
TS-565	A	26	13	26	14	same comment as above: emissions of energy sector includes end uses related emissions and therefore the message to policy makers is not adequate (Jacques Rilling, CSTB Building Research Center)	Taken into account with reply to comment TS-567.
TS-566	A	26	13	26	15	This text confuses energy use with the energy sector. As written it implies that emissions from the transportation and buildings sectors could be ignored, which is clearly not the case. Change "the energy and industry sectors." to "energy use and non-energy industrial emissions." Energy use covers all sectors and makes the statement correct.	Accepted. Suggested change is appropriate.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-567	A	26	13	26	15	This text confuses energy use with the energy sector. As written it implies that emissions from the transportation and buildings sectors could be ignored, which is clearly not the case. Change "the energy and industry sectors." to "energy use and non-energy industrial emissions." Energy use covers all sectors and makes the statement correct. U.S. Government (Government of U.S. Department of State)	Taken into account with reply to comment TS-567.
TS-568	A	26	14	26	15	Does this passage imply that scenarios all assume that other sectors, such as transport, do not significantly contribute to the reductions (Government of The Netherlands)	Taken into account with reply to comment TS-567.
TS-569	A	26	14	26	15	60-80% of reductions from industry/energy is not consistent with 30-40% from landuse (Government of The Netherlands)	Accepted. Typo to be corrected.
TS-1518	A	26	14	0	0	If "60 to 80 percent of all reductions would come from energy" the remaining should be from 20 to 40 percent, not "30 to 40 percent" as stated. (VOLODYMYR DEMKINE, UNEP)	Accepted. Typo to be corrected.
TS-570	A	26	15	0	0	is it not 20 to 40 percents? It would be more consistant with figures in line 14. (Jacques Rilling, CSTB Building Research Center)	Accepted. Typo to be corrected.
TS-571	A	26	15	0	0	"...30-40 percent." should read "...20 to 40 percent." (?) (Ronald Hutjes, Alterra)	Accepted. Typo to be corrected.
TS-572	A	26	15	0	0	It concerns me that land-use is repeatedly cited as making policies more cost effective (according to the large, long-term models) without any discussion of the difficulty of implementing such options, particularly compared to the options for industry and energy (validation, monitoring, verification issues, etc.) This statement seems to be a summary of chapter 3 without the qualifications of the land-use chapter. Seems like this should be the place to make the linkages between chapters instead of just restating the conclusions from the chapters. (Katherine Casey Delhotal, Research Trinagle Institute)	Noted. Some clarification is merited that the numbers given pertain to cumulative abatement over the century and that a ideal global policy is assumed that does not account for instutional friction and barriers. Implementation costs for land-based mitigation are at least partially accounted for, though cross references to Ch8, Ch9, and biomass discussions of implementation issues is appropriate.
TS-573	A	26	15	26	15	Change "30" to "20". U.S. Government (Government of U.S. Department of State)	Accepted. Typo to be corrected.
TS-53	B	26	15	26	15	Replace "30" with "20" (Government of European Community / European Commission)	Accepted. Typo to be corrected.
TS-	A	26	24	26	27	This section states: "Literature identifies low-cost technology clusters allowing for	Check replies to Chap. 3 Summary, page 6,

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
574						endogenous technological learning with uncertainty. This suggests that a decarbonised economy may not cost any more than a carbon-intensive one, if technological learning curves are taken into account." These two sentences are repeated word-for-word in the Chap. 3 Summary, page 6, lines 30-32. The only other reference is in Chap. 3, page 97, lines 16-19, which states: "Gritsevskyi and Nakicenovic (2000) identified some 53 clusters of least cost technologies allowing for endogenous technological learning with uncertainty. This suggests that a decarbonized economy may not cost any more than a carbon intensive one, if technology learning curves are taken into account." That is the extent of the discussion. This seems very thin. The final sentence of this paragraph should be modified so that it does not suggest that this is a widely held conclusion. Start this sentence: "At least one study has found that…" replacing "This suggests". A caveat should be added to make clear that the majority of studies do not find this to be true. U.S. Government (Government of U.S. Department of State)	lines 30-32, and Chap. 3, page 97, lines 16-19
TS-575	A	26	29	27	1	The costs will depend on the baseline emissions as described here. In addition to the relationship between the stabilization levels and the abatement costs (and GDP losses), the relationship between the levels of emission reductions from baseline and the abatement costs (or GDP losses) should be shown (Figure 3.28 is a good figure). This will be an important message for readers. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Noted. Good suggestion. Will consider alternatives for relaying the relationship between emissions reductions and GDP losses. Space constraints may prevent including an additional figure.
TS-576	A	26	29	26	30	depend not depends, technological not technology (Rachel Warren, University of East Anglia)	Noted. Will remove "s" on "costs" which will address issue.
TS-577	A	26	29	26	30	does the cost of stabilisation not also depend on demographic and economic development? (Government of The Netherlands)	Noted. "Baseline" meant to represent, among other things, both drivers listed. Can note these drivers parenthetically.
TS-578	A	26	29	26	29	delete "target and" (Government of The Netherlands)	Noted. Clearer text required. Current text was meant to capture target characteristics other than the target level (e.g., timing).
TS-579	A	27	1	27	5	In sentences units are shown in ppmv, while in Figure TS.15a) stabilization level is shown in W/m2. This is confusing. Units in Figire TS.15a) should be changed to ppmv. (Mitsutsune Yamaguchi, Teikyo University)	Accepted. Consistency between the text and figure is desirable. Suggested units will be considered in context of plans for entire chapter.
TS-	A	27	1	27	1	Typo error. "Global mitigation costs 4 rise with .."	Accepted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
580						(Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	
TS-581	A	27	1	27	5	Negative GDP losses due to GHG emission reductions are peculiar and cannot generally accepted. The model showing the negative GDP losses presumes a mechanism that the larger carbon tax is imposed, the larger investments may take place by the revenue obtained through the carbon tax, and then employment increase and GDP increase will follow. In reality the carbon tax will work to diminish economic activities because of the higher energy prices, and GDP in total will be decreased. However, the model does not consider these effects. The model presumptions could be justified for short time periods; however, for a long time span such as up to 2050 and 2100, the presumed mechanism can never be justified. For these reasons, I strongly recommend you to delete the negative values in Figure TS 15a and the related words. If not, you should at least provide with description regarding the limitations of the model. Otherwise, IPCC will confuse and mislead readers. (the same comments to Figure SPM 5 and Figure 3.29a) (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Noted. Underlying figure and text in chapter will be revised.
TS-582	A	27	1	27	1	Please, improve the edit (Global mitigation costs4 rise …) (Government of Austria)	Accepted.
TS-583	A	27	1	27	1	"4" in "costs4" should be written as superscript. (Government of Pakistan)	Accepted.
TS-1519	A	27	1	0	0	The text, referring to Figure TS15, operate ppm of CO2 eq and % of GDP loss. The Fig. TS15 (a) operates W/m2 and % of GDP loss. Comparing the text and the figure is therefore difficult. Suggest harmonizing. (VOLODYMYR DEMKINE, UNEP)	Accepted. Consistency between the text and figure is desirable. Suggested units will be considered in context of plans for entire chapter.
TS-584	A	27	2	27	2	typo, change "costs4" to "costs" (Government of The Netherlands)	Accepted.
TS-585	A	27	2	27	2	Insert "global" before "GDP". (Government of Australia)	Accepted.
TS-586	A	27	4	27	5	This para should reflect that since TAR the range of scenarios has expanded below stablisation around 550 ppm-eq. and that cost estimates for scenarios at or below 450 ppm-eq. are pointing to a comparable range of cost as for 550 ppm-eq., see figure TS15a) for scenarios below 3.25 W/m2 (cat.A) and figure TS15b) for with those scenarios mostly within the EMF21 range of cost estimates. Proposal: replace "for 450 ppm ....reliable estimate (HM)" with "since TAR, some new scenarios have estimated costs for 450 ppm CO2-eq and below. These results confirm	Noted. Underlying chapter figure to be revised with additional scenarios, some with tighter targets, at which point the text will be revised as well.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						gradually increasing costs with lower stabilisation levels, generally in the order of up to a few percent of GDP." (Government of German Federal Environment Ministry)	
TS-587	A	27	10	27	15	Figure number and figure caption are missing. (Government of Finland)	Noted. Separated with page break. Layout issue.
TS-588	A	27	11	0	0	Figure TS. 15(a) The model of E3MG showing the negative value of GDP losses presumes a mechanism that the larger carbon tax is imposed, the larger investments may take place by the revenue obtained through the carbon tax, and then employment increase and GDP increase will follow. In reality the carbon tax will work to deminish economic activities because of the higher energy prices, and GDP in total will be decreased. However, the model does not consider these effects. The model presumptions could be justified for short time periods; however, for a long time span such as up to 2050 and 2100, the presumed mechanism can never justified. For these reason, we strongly recommend you to delete this models results in Figure SPM.5 and together with relevant reference in the text. (Government of Japan)	Noted. Underlying figure and text in chapter will be revised.
TS-589	A	27	11	28	7	Figure TS 15: The two panels are quite complicated and need to be supported by a stronger description of the methodology and what the figures illustrate. In addition the authors need to provide an explanation of "on what basis" the studies provided, were selected. (Government of Australia)	Noted. Underlying figure to be revised. Also, plan to make text and figures consistent in use of ppm or W/m2, which should improve readability.
TS-590	A	28	1	28	5	I don't understand end of caption of Figure TS15, last sentence is confusing e.g. use of instead and detail. (Rachel Warren, University of East Anglia)	Accepted. Needs to be re-worded.
TS-591	A	28	3	0	0	delete "of" between "Selected" and "studies" in the caption of Figure TS.15. (Government of Pakistan)	Accepted.
TS-592	A	28	7	28	7	In the explanation to Figure TS.15b) the following text should be added: "It should be noted, that new stabilisation studies extend below the range of stabilisation levels reported in the TAR, while reporting a cost range largely comparable to the range of EMF-21 models and WRE scenarios (TAR)" (,)	Noted. Will consider additional text noting the relationship between the TAR and post-TAR results.
TS-593	A	28	7	28	7	Add to the end of the figure caption "which overestimates the costs". (Government of Finland)	Noted. Underlying chapter figure to be revised, including text and caption.
TS-594	A	28	8	28	8	typo, delete "of" before "studies" (Government of The Netherlands)	Accepted.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-595	A	28	10	28	12	Abbreviations CCS and BECCS should be explained (Government of Czech Republic)	Accepted.
TS-54	B	28	10	28	11	Explain abbreviations and introduce CCS and BECCS in more detail. (Government of European Community / European Commission)	Accepted.
TS-596	A	28	11	28	11	Full spelling for BECCS please for readers' friendliness. (Mitsutsune Yamaguchi, Teikyo University)	Accepted.
TS-597	A	28	11	28	11	Please, define BECCS. It isn´t included in the list of abbreviations. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted. Need to add to glossary as well.
TS-598	A	28	11	29	5	Figure TS16 and text expand acronym CCS and BECCS. Add footnote to Figure TS16 explaining that "fossil fuel switch" means switching from e.g. coal to oil and not switching from fossil to renewables (Rachel Warren, University of East Anglia)	Noted. Clarification will be provided on both items.
TS-599	A	28	11	28	11	Please, include the abbreviation BECCS (Biomass energy with carbon capture and storage) in the glossary. (Government of Austria)	Accepted.
TS-600	A	28	11	28	11	What are CCS and BECCS? Please spell out for readers not familiar with these terms. U.S. Government . (Government of U.S. Department of State)	Accepted.
TS-601	A	28	11	28	11	Add "renewables, " after "Those could include" to reflect the fact that many low stabilisation scenarios foresee extensive investment strategies towards renewable energy technologies. See, e.g., Figure 7, page 93 in Edenhofer, O, Kemfert, C., Lessmann, K., Grubb M., Koehler J. (2006): Induced Technological Change: Exploring its Implicatons for the Economics of Atmospheric Stabilisation. Sythesis Report from the Innovation Modeling Comparison Project. In: Edenhofer, O., Carlo Carraro, J. Koehler, Michael Grubb (eds): Endogenous Technological Change and the Economics of Atmospheric Stabilisation. The Energy Journal Special Issue. The underlying and misleading Figure TS.16 does not indicate how much of the biofuels is combined with BECCS and singling out BECCS from biofuels seems odd. To mention renewables in general would correct this imbalance. (Government of German Federal Environment Ministry)	Noted. Underlying chapter figure to be revised with additional models. However, current results in the figure do not find Other Renewables to be a dominant strategy over the century. Will consider separating BECS from biofuels total, creating a single renewables category will obscure the role of BECS.
TS-55	B	28	11	0	0	What are CCS and BECCS? Please spell out for readers not familiar with these terms. U.S. Government (Government of U.S. Department of State)	Accepted.
TS-602	A	28	13	28	14	delete this sentence (duplication) (0 0, IPCC TSU WGIII)	Noted. Redundant with sentence on page 27 lines 5-6.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-603	A	28	14	28	17	move to Page 27, Line 6, after abatement only. And put this into perspective (substantial reductions of N2O emissions is difficult!) (0 0, IPCC TSU WGIII)	Noted. The specific role of non-co2 abatement is discussed in the chapter. Consider adding a few words about the primary non-co2 and sinks abatement options.
TS-604	A	29	0	0	0	The message of this figure seems questionable; this figure should be deleted. Other studies indicate much higher contributions of renewables compared to CCS. Especially, the low fraction of "other renewables" does not seem plausible given the very high potential of technologies such as wind, solar, geothermal. Therefore, the limited set of models leads to a bias towards CCS. It is recommended to delete this figure as long as it is not embedded in a critical discussion of the underlying parameters (very pessimistic for renewables, very optimistic regarding CCS). The high CO2 mitigation potential of fossil CCS is questioned by other authors for a number of reasons, amongst others time frame of technological availability, high additional costs which move CCS to a similar cost performance as the mix of renewables, local impacts and risks, and leakage which lowers the CO2 reduction depending on the upper time integration boundary (time frame 100 years? 1000 years?) etc. (Government of German Federal Environment Ministry)	Noted. Underlying chapter figure to be revised with additional models. Some discussion in the chapter and in the TS of BECS uncertainty and acceptability is appropriate.
TS-605	A	29	0	0	0	Delete Figure TS.16 because it is misleading to the wrong conclusion that renewables would play a minor part in mitigation between 2000 and 2100 as this figure shows only the additional mitigation potential compared to a baseline scenario with an already high share of renewable energy resources (up to 55% of primary energy in MESSAGE). This fact must be explained in detail in chapter 3. Due to its misleading content, the figure has to be deleted from the TS and SPM. Instead, we suggest to use the numbers given in Table 4.4.4, column 3, for a new figure. (Government of German Federal Environment Ministry)	Noted. Underlying chapter figure to be revised with additional models. Also, appropriate to add a note that assumptions about baseline adoption of technologies influence results as well (possibly in sentence page 26 lines 29-30).
TS-606	A	29	1	0	0	Figure TS.16: this figure is misleading since it gives the feeling that there is a high level of agreement between the potential of different mitigation options. Specifically the fact that the role of "other renewable" small in the time frame until 2100 is questionable. In (http://www.wbgu.de/wbgu_jg2003_engl.html, figure 1) you find a scenario with a very different view. (Robert Pitz-Paal, German Aerospace Centre (DLR))	Taken care of with previous responses to comments on figure.
TS-607	A	29	1	0	0	It would be helpful to explain clearly wht figure TS.16 means. (Government of UK)	Taken care of with previous responses to comments on figure.
TS-	A	29	1	0	5	“Cumulative emissions reductions for alternative mitigation measures (2000-2100)”	Noted. See chapter for further details

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
608						In Fig. TS.16 Biofuels (incl. CCS) have rather high values. About 180 GtC (2000-2100) for stabilization level 600 ppmv CO2-eq. means e.g. yearly reduction about 7 Gt/Pg CO2-eq. during 100 years. (Government of Finland)	supporting the results.
TS-609	A	29	1	29	6	Figure TS16: The authors need to provide more explanation for this Figure. In particular they need to explain why IMAGE and MESSAGE models were used as illustrative. In addition the authors need to provide a note to indicate what is included in each category. For example, does biomass incorporate both transport and electricity; and what "other renewables" are included? on what "Other renewable" sources were included, as the figure seems particularly small when compared to Non-CO2. The authors also should explain why the transport sector has not been included. Need a note to indicate what is included in each category. (Government of Australia)	Noted. Underlying chapter figure to be revised with additional models. Discussion of general sensitive model assumptions already present.
TS-610	A	29	2	0	0	Figure TS.16. I am not sure how to interpret this figure, so others may have the same problem. I assume that this is based on some modeling of what the various technologies are capable of delivering and that they are not directly additive. It also begs the question of what limits the technology from making a bigger contribution. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	Noted, text to be revised to emphasize that the results give economic potentials taking into account competition between options.
TS-611	A	29	3	29	3	typo delete "(" before "MESSAGE" (Government of The Netherlands)	Accepted
TS-612	A	29	4	29	4	typo, change "repectively" to "respectively" (Government of The Netherlands)	Accepted
TS-613	A	29	12	29	12	Add "renewables, " after "energy conservation, " because these technologies' contribution is large and partly hidden in the Figure TS.16 by the fact that the Message model includes already a large contribution of renewables in the baseline. The message to policymakers should be clear, that renewables are a major strategic component of climate policy during this century. (Government of German Federal Environment Ministry)	Accepted, figure will be extended to other models
TS-614	A	29	13	29	16	Has the literature examined the possibility of obtaining stringent stabilisation targets with CCS but without nuclear? I think it would be key to state whether the low targets can be attained without nuclear or not, but perhaps this does not exist in the literature? (Rachel Warren, University of East Anglia)	Taken into account. Will evaluate US CCSP scenarios that make this comparison.
TS-615	A	29	22	29	22	add "in combination with policy intervention" after "technological change ". Technological change alone does only marginally reduce emissions, it reduces the cost of reductions which have to be demanded for by active policy intervention.	Rejected. Technology change could be derived through market and policy intervention.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of German Federal Environment Ministry)	
TS-616	A	29	0	88	0	Derive Figure for 2030 and compare with Table on page 88 (also for SYR) (Rob Swart, MNP)	Noted, figure for 2030 will appear as part of chapter 11 TS.
TS-56	B	30	3	30	9	Figure TS.17: Change x-axes names into more self-explaining, less cryptic names. (Government of European Community / European Commission)	Rejected, it is hard to give a easy understandable name for the x-axes, anyway need explaination.
TS-57	B	30	3	30	9	Figure TS.17: Caption: add "energy related" carbon emissions (Government of European Community / European Commission)	Accepted.
TS-617	A	30	17	0	0	which scenario database? And how many scenarios? (0 0, IPCC TSU WGIII)	Noted, text revised to explain the database
TS-618	A	31	8	31	8	"scenario's" should be replaced with "scenarios". (Government of Pakistan)	Accepted.
TS-619	A	31	23	0	0	Section 3.5 is partly a duplication of Section 1.4 (Page 9) (0 0, IPCC TSU WGIII)	Will need to reconcile
TS-620	A	31	29	31	30	Should there be a reference to WGI? Again, the TS would be a good place to summarize information across chapters and working groups if possible. (Katherine Casey Delhotal, Research Trinagle Institute)	They should be referenced to WG2
TS-621	A	31	29	31	35	Delete 4 sentences (0 0, IPCC TSU WGIII)	See below
TS-622	A	31	29	31	35	comment: we find the description of the perspective of adaptation rather poor and incompleet and suggest some language along the lines of: "Adaptation measures protect against specific climate impacts at the locations they were taken, but not against other impacts or on other locations. Even for these specific climate impacts there are (technical en economic) limits and measures can aggravate impacts elsewhere. When for instance dykes are raised around a plot, it will keep surface water out, but drought and high temperatures still occur. Higher dykes may become too expensive, and the risk of flooding for neighbouring plots increases. In addition, adaptation may increase CO2 emissions, e.g. air conditioning en snow cannons, that use much energy. Adaptation may seem the preferable option when global solidarity is feeble, since the benefits are local. But recent assessments indicate that adaptatie and mitigation are no alternatives. Wherever en whenever adaptation measures lack, man and ecosystem could suffer from climate change that is the result of too little mitigation in the past. Adaptation is nevertheless the only way to protect against the impacts of dedicated climate change." (Government of The Netherlands)	When refererring to mitigation and adaptation the operative word is interactions and so the treatment needs to be reworded

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-623	A	31	30	31	30	Delete "partly" insert "Some level of" at the start of the sentence. (Government of Australia)	This needs to be reworded
TS-624	A	31	38	0	0	Insert Page 37, Lines 30-33 here (0 0, IPCC TSU WGIII)	See above – the whole issue of the interactions between adaptation ad mitigation is currently inconsistently written about in different parts of the TS. It should be clarified and cross referenced to Ch 18 WG2.
TS-625	A	31	39	31	41	This section states: "One of the methodological challenges in assessing any economic trade-off among the levels of mitigation, adaptation and residual impacts is valuing and aggregating the damages (impacts) of climate change across differing locations." Wouldn't an assessment of possible climate change benefits across different locations also be included? U.S. Government . (Government of U.S. Department of State)	Agree
TS-58	B	31	39	31	41	This section states: "One of the methodological challenges in assessing any economic trade-off among the levels of mitigation, adaptation and residual impacts is valuing and aggregating the damages (impacts) of climate change across differing locations." Wouldn't an assessment of possible climate change benefits across different locations also be included? U.S. Government (Government of U.S. Department of State)	comment repeated
TS-626	A	31	42	31	44	Please give examples of such metrics here. (Government of German Federal Environment Ministry)	OK
TS-627	A	32	0	0	0	footnote 8, we failed to find tables TS3.1 and TS3.2, a reference to table TS.1, TS.2 and TS.3 could not be correct and tables TS.31 and TS.32 do not exist (Government of The Netherlands)	OK
TS-628	A	32	0	0	0	footnote 8, typo, delete ")" (Government of The Netherlands)	OK
TS-629	A	32	3	32	7	This does not discuss mit./adaptation interaction! (0 0, IPCC TSU WGIII)	See above – discussion needs to be rewritten
TS-630	A	32	5	32	5	Define GMT. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	OK
TS-631	A	32	5	32	5	Do we understand correctly "global mean surface temperature" would be the right expression? (Government of The Netherlands)	Yes
TS-	A	32	9	32	12	Table TS.5 characterizes the categories of mitigation scenarios differently than	OK

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
632						Table SPM.1, though both are talking about the set of 117 scenarios. The two tables should be made consistent. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-633	A	32	9	0	0	TableTS5: this table does not illustrate mit/adaptation interaction. Move columns 4-7 to TableTS4 (0 0, IPCC TSU WGIII)	OK but they will remain separate in CH 3
TS-634	A	32	9	32	14	Table TS.5: It is suggested to indicate by a footnote which scenarios may belong to the type of so-called overshooting scenarios and therefore require deployment of technologies such as BECCS. (Government of Austria)	OK
TS-635	A	32	9	32	14	Table TS.5: It is proposed to explain the abbreviation "dnr". (Government of Austria)	OK
TS-636	A	32	9	32	12	Table TS.5 characterizes the categories of mitigation scenarios differently than Table SPM.1, though both are talking about the set of 117 scenarios. The two tables should be made consistent. U.S. Government (Government of U.S. Department of State)	OK
TS-637	A	32	9	32	13	Table TS.5: line 4, column 4 should read 2000-2030 (peak for cat. A) according to chapter 3.3.5.1, page 16, line 16 or figure 3.23. This will have to be revised if category A is split into two new categories to provide for a "2 C category". (Government of German Federal Environment Ministry)	We will check
TS-59	B	32	9	32	12	Table TS.5 characterizes the categories of mitigation scenarios differently than Table SPM.1, though both are talking about the set of 117 scenarios. The two tables should be made consistent. U.S. Government (Government of U.S. Department of State)	OK
TS-638	A	32	12	32	12	figure TS.5, comment: we do not know the meaning of "dnr" (Government of The Netherlands)	OK
TS-639	A	32	12	32	12	figure TS.5, comment: it seems not logic that peaking for 930 ppme would need to occur before 2090, while peaking for 785 ppme could be postponed untill 2100 (Government of The Netherlands)	We will check
TS-640	A	32	14	32	17	It is not correct to say that global temperature as given in Table TS.6 (which is equilibrium temperature) can be used to link emission pathways and mitigation scenarios with climate impacts. It takes thousands of years for equilibrium warming levels to be reached, and it depends on which impacts one wants to avoid, and how they depend on timing and rates of temperature change, and their resilience against temporary overshoot. One could reach eventual equilibrium temperatures (in about two millennia) via all sorts of wild and incoherent emission pathways in the shorter	OK this should be clarified that the times to equilibrium are in fact shorter than suggested in this comment

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						term (ie next one or two centuries), unless one makes additional assumptions about the pathways on which stabilisation is to be achieved. Please provide text in the TS that explains the implicit assumptions about stabilisation pathways, in particular overshoot pathways. Please see also my comment on the SPM page 5 line 9 on this issue. (Andy Reisinger, TSU IPCC Synthesis Report)	
TS-641	A	32	14	0	0	introduce between TableTS5 and Line 14 new section title: 3.6 Long term mitigation policy in relation to climate impacts (0 0, IPCC TSU WGIII)	Agree
TS-642	A	32	14	32	15	It is proposed to substitute "concern" by "concerns". (Government of Austria)	OK
TS-643	A	32	20	32	20	In footnote I suspect it is meant to read "Table TS6" not "Table TS3.1" and extra bracket to delete and probably Table TS3.2 should not be referred to but again this is "Table TS6"? (Rachel Warren, University of East Anglia)	OK
TS-644	A	33	0	33	4	Table TS.6: This table is very much appreciated. However, it seems strange that for the equilibrium warming level the probability jumps from medium to very likely but not to likely at 350 ppm stabilization concentration. Furthermore it would be informative to indicate the current (2006) level of GHG concentration in terms of CO2 equivalence. (Government of Austria)	In discussion with WG1
TS-645	A	33	1	0	0	Table TS6 more than deserves to be included in the SPM (Ronald Hutjes, Alterra)	Will consider
TS-646	A	33	1	0	0	change title of TableTS6 into: Probability to stay below eq. warming levels for certain chosen values of CO2eq conc. and eq. warming (0 0, IPCC TSU WGIII)	Noted but depends on outcome of discussion with WG1
TS-647	A	33	1	33	5	Legend in Table TS-6 concerning to uncertatinties should be consistent with e.g. Table TS.2 (Government of Czech Republic)	See above
TS-648	A	33	1	0	0	The radiative forcing is quoted in the table legend but not included in the table. (this comment also applies to table 3.12 in chapter 3. (Government of Spain)	OK
TS-649	A	33	1	0	0	Inset legend in the table is unnecessary, it can be omitted or its information included in the text legend. (This comment also applies to table 3.12 in chapter 3.) (Government of Spain)	OK

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-650	A	33	1	0	0	Table TS.6 This is a very informative table, so we propose that it is included in the SPM. (Government of Norwegian Pollution Control Authority)	Will consider
TS-651	A	33	5	33	5	Add new pgph which reads (with text mostly taken from WG3 Ch 3 where it cross-links to WG2 Ch 19) "The lower the stabilisation level, the lower the damages due to climate change in both market and non-market sectors in all world regions, the lower the risk of abupt changes in the earth system and the less the need for (and hence costs of) adaptation in human systems. Hence higher mitigation costs are offset by lower adaptation costs. For example, from table TS6 stabilisation at 450 ppm CO2 equivalent would be likely to limit impacts to those associated with temperature rises of 0-2 degrees above 1990" (or convert to whatever baseline is decided upon) and avoid those listed (WG2 Ch 19) as occurring for temperature rise of 2-4 degrees above 1990 which would be likely to be incurred for higher stabilisation targets such as 550 ppm CO2 equivalent. Hence, referring to WG2 Ch 19, examples of resultant avoided climate change damage include that the risk of a decline in food production would be limited to low latitudes (0-2C) as opposed to being global (2-4C); the risk of widespread or complete deglaciation of the Greenland Ice Sheet would be lowered; drought and forest fires would be much less widespread; damages to infrastructure would be limited as opposed to widespread; increases in water stress would be limited to areas where significant water stress already occurs rather than stressing new areas; the risk of a widespread conversion of forest to grassland amplifying warming would be greatly reduced, and the risk of species extinctions from climate change would be reduced from one third to one quarter of species. (Or make this point by including a table). (Rachel Warren, University of East Anglia)	Text to this effect should be considered – exact numbers will depend on outcome of dicsusion with WG1 and WG2 as the analysis is still ongoing
TS-652	A	33	5	0	0	In summary?? This is the first time that integrated assessment tools are introduced! (0 0, IPCC TSU WGIII)	OK
TS-653	A	33	5	33	8	Figure TS.6 shows a stark set of temperature likelihoods v emission levels. I think this figure could be usefully put in context by reference to the Dangerous Climate Change conference (Exeter 2005). The projected implications of the >2 deg C scenarios need setting down alongside figure TS.1. (Government of UK)	OK agree
TS-654	A	33	8	33	9	It is unclear what is meant by "more sophisticated, probabilistic representation". However any moves towards providing a presentation of possible climate change outcomes in probabilistic form should be supported, as much of the public reporting of IPCC, talks about a climate change range with an implication that the underlying	OK will clarify

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						distribution is rectangular, which is not the case. (Government of Australia)	
TS-655	A	33	10	33	11	It appears misleading to refer to a growing understanding of abrupt changes in geophysical systems at the 2-4 and possibly 0-2ºC range. No model predicts an abrupt MOC shut-down for any of the SRES scenarios by 2100, and MOC changes beyond 2100 are too uncertain to be assessed with confidence (according to WG1 assessment). I am not aware of any other "abrupt geophysical system" change that we can predict with any degree of confidence. It is certainly true that we expect eg Greenland to melt at about 3ºC global temperature rise, but we have no indication that this would be an abrupt change - all we know points to a process taking more than one thousand years. There is lots of speculation about the possibility of abrupt changes, and we know more about abrupt changes in the past, but it hasn't yet helped us identify thresholds for ABRUPT changes in the future. but it would appear inconsistent with the assessment undertaken by WG1 to talk about "a growing understanding of abrupt changes in geophysical systems at future warming between 0 and 4 deg C". (Andy Reisinger, TSU IPCC Synthesis Report)	We will make sure consistent with WG1
TS-656	A	33	11	33	11	Descriptions on abrupt change. I suppose 2-4 C range will apply for "risks from the future large scale discontinuities" and 0-2 C range will apply to "risks to unique and threatened systems (in IPCC TAR wordings). If so, this should be clearly distinguished not to mislead or confuse readers. (Mitsutsune Yamaguchi, Teikyo University)	OK
TS-657	A	33	15	0	0	Section 3.6: This section should include a clear statement that it takes thousands of years to reach equilibrium. Many policy makers may not be aware of this time scale, and equate "stabilisation" with what is going to happen by 2100 or shortly afterwards (hence I believe the early discussion of 550ppm CO2 as a stabilisation target, which gives about 2ºC rise above 1990 by 2100 even when other GHGs are also included, but a much higher warming at equilibrium). It's the difference between climate sensitivity and transient climate response. I believe it is important to clearly spell out that equilibrium warming levels are only one, but not necessarily clear or sufficient, guide to climate impacts and avoided damages, or to mitigation pathways leading to stabilisation, because ultimate equilibrium could be reached over thousands of years via overshoot not only of concentrations but even of temperature itself. The assumptions implicit in the literature on equilibrium warming should be clearly spelt out to avoid the impression that there is a self-evident connection between long-term equilibrium warming goals and short-term	OK we will clarify the timescales to equilibrium

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						actions that would be consistent with this goal. The picture is unfortunately more complex. (Andy Reisinger, TSU IPCC Synthesis Report)	
TS-658	A	33	15	33	15	A phrase like "dicision making" may be added at the end of this title. (Government of Pakistan)	OK
TS-659	A	33	17	34	2	delete (0 0, IPCC TSU WGIII)	comment incomprehansible.
TS-660	A	33	17	34	7	comment: these two paras seem to be translated into English and are very complicated; we suggest to rephrase them to read something like "Before choosing an emission reduction pathway/target, several value judgements need to be made, notably on the discount rate, the relative preference for adaptation and mitigation, on the stabilisation concentration that is regarded to imply a safe level of climate change and on the national responsibility accepted for climate change. But the optimal timing and mix of mitigation options also depends on the respective learning curves of these options." (Government of The Netherlands)	3.6
TS-661	A	33	25	0	0	Footnote 10: Please consult with WG1 about the consistent treatment of uncertainty in deriving the specific information in this table, and ensure that this trickles down to the chapter level. The translation of "likely" into an 80% log-normal confidence interval should be checked with experts from WG1 to ensure consistency across IPCC WG reports. (Andy Reisinger, TSU IPCC Synthesis Report)	Agree – we are discussing with WG1
TS-662	A	34	4	34	7	Factors affecting decisions about the timing of policy (ie insert "decisions"). Add bridging sentence "These factors are commonly taken into account in modelling exercises". (Rachel Warren, University of East Anglia)	OK
TS-663	A	34	4	34	7	too complicated (0 0, IPCC TSU WGIII)	OK we will expand and explain better
TS-664	A	34	4	34	7	Section is hard to understand. (Government of German Federal Environment Ministry)	OK we will expand and explain better
TS-665	A	34	9	34	9	Add "in models which assume" at start of paragraph in place of "with" (Rachel Warren, University of East Anglia)	OK
TS-666	A	34	9	34	16	This paragraph is pretty dense: and to struggle through temporal and discount rates etc only to find that any level of intervention is justified to secure a high probability of avoiding a low probablility high impact will leave some people wondering what the significance of this paragraph really is. Suggest simplifying.	In fact we have to explain better the underlying mechanisms

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of UK)	
TS-667	A	34	9	34	15	This para is very relevant indeed. It might be useful to link it to relevant chapters of WG II report (eventually in the Synthesis Report). Furthermore it seems relevant to include recent scientific papers about the possibility of instability of the thermohaline circulation (see scientific results from ESPOO-ICS institute) (Government of Austria)	OK
TS-668	A	34	12	34	14	It says "recent modelling" in singular term. If only one modelling has shown something, it should not be cited here. If not this sentence should begin with "many modellings". (Mitsutsune Yamaguchi, Teikyo University)	OK
TS-669	A	34	13	32	13	This should read "tighten" instead of "alter" to reflect the fact, that inclusion of catastrophic events leads to earlier and more stringent optimal reductions. (Government of German Federal Environment Ministry)	OK
TS-670	A	34	14	34	15	Delete the sentence that bigins with "it has been ---".This sentence is quite misleading. Just mention one example. The outcome of cost benefit analysis differs greatly depending on what discount rates (especially for pure time preference discount rates) the model uses. Without mentionning discount rate, it is impossible to write in such a conclusive way. (Mitsutsune Yamaguchi, Teikyo University)	OK as it stands the sentence does not explain fully the issue. We will totally rewrote
TS-671	A	34	14	34	15	The sentence of "It has been concluded that …" should be deleted due to the following reasons. 1) The litterature will not be a reviewed paper. 2) The original descriptions would be lead from the paper of Mastrandrea and Schneider, Climate Policy, 2001. However, the paper only attempted the sensitivity analyses regarding to global warming impacts of THC with the ranges assumed by aurthors and obtained a wide range of the optimal emission profiles. The description in the paper by Azar and Schneider cannot be lead from the results of the paper by Mastrandrea and Schneider. (the same comment to Ch.3 p.119) (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	In fact we think in terms of rewroting more fundamentally this section
TS-672	A	34	14	34	14	Replace "carbon tax" with "emissions price". (Government of Australia)	OK
TS-673	A	34	14	34	15	give reference here (Government of German Federal Environment Ministry)	OK
TS-674	A	34	15	34	15	comment: this para actually discribes an absent graph, which is cumbersome for the reader; we suggest to add a figure showing typical damage functions and officially applied discount rates.	This comment refers to a more fundamental question about a better presentation of quantitative assumptions

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of The Netherlands)	
TS-675	A	34	19	34	19	we suggest to add "Some changes, such as in the energy infrastructure, may take several decades between the strategic decision and the eventual full realisation." (Government of The Netherlands)	We will consider seroiusly
TS-676	A	34	22	34	31	Explain that the table is showing the results of top-down modelling (cf the outcome of chapters 4-10 and 11). Suggest add to TS7 and TS8 a row detailing which SRES baseline was assumed, B2 or another, for comparison with Table TS.19 which has B2 as a reference scenario. (Rachel Warren, University of East Anglia)	Table being revised in coordination with CH11 on the costs and potentials.
TS-677	A	34	25	34	26	The expression "less than $10/tCO2eq to approximately $60/tCO2eq" should be described more accurately as "$2/tCO2eq to $57/tCO2eq". (Mitsutsune Yamaguchi, Teikyo University)	refer comment TS-676
TS-1523	A	34	27	34	28	comment: we suggest to shorten this rather prozaic sentence by deleting "complete 'what' and 'where' flexibility, i.e. there is" (Government of The Netherlands)	reject. Terms are imprtant and well established in climate literature.
TS-678	A	35	1	0	0	The table raises the question why the required reduction percentages for the same stabilization target are so different, e.g. GRAPE has one of the highest baselines and only requires 3 % reduction from that baseline in 2030 for 4.5 W/m2. A line in the table with some brief remarks explaining the high/low results would be very informative. (Rob Swart, MNP)	Table being revised in coordination with CH11 on the costs and potentials.
TS-679	A	35	1	35	0	Table TS.7. Given the wide variability in the numbers for any one sector, plus all the differences in the sectoral classifications between the models and chapters 4-10, plus all the aggregations and "not sum to global total" , I would recommend deleting the "sector mitigation potentials" and just include the "Global Total" in this table. (,)	Table being revised in coordination with CH11 on the costs and potentials.
TS-680	A	35	1	0	0	Table TS7 IPAC and GRAPE are of no value in respect of waste management - 0 and 4 are misleading and wrong. (Michael Jefferson, World Renewable Energy Network & Congresses)	Table being revised in coordination with CH11 on the costs and potentials
TS-681	A	35	1	0	0	TableTS7: we need more conclusions/consequences here (for example: total red. potential varies from 3-36%) (0 0, IPCC TSU WGIII)	Table being revised in coordination with CH11 on the costs and potentials
TS-682	A	35	1	35	5	All entries in the table written as “Included in another sector” should be written as “Included in xyz sector”, where “xyz” is the specific sector it is included in. As written now, too much information is missing in the 15 boxes that say only	Table being revised in coordination with CH11 on the costs and potentials

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						"Included [or Incl.] in another sector" U.S. Government (Government of U.S. Department of State)	
TS-683	A	35	1	36	9	Table TS.7: The WIAGEM-model seems misplaced here, since reaching a 2 C limit should require much lower forcing than 4.5W/m2. Including WIAGEM in the 3-4 W/m2 range would alter the range of marginal costs reported on page 36, line 9 to $9 to $190. (Government of German Federal Environment Ministry)	Table being revised in coordination with CH11 on the costs and potentials
TS-60	B	35	1	35	5	All entries in the table written as "Included in another sector" should be written as "Included in xyz sector", where "xyz" is the specific sector it is included in. As written now, too much information is missing in the 15 boxes that say only "Included [or Incl.] in another sector" U.S. Government (Government of U.S. Department of State)	Table being revised in coordination with CH11 on the costs and potentials
TS-684	A	35	16	35	16	The authors need to explain what they mean by "the odds". (Government of Australia)	Table being revised in coordination with CH11 on the costs and potentials
TS-685	A	36	7	36	7	Difficult to understand what term 'mitigation potential' really means (see also TS.8). This term is not contained in the taxonomy of points on 'potential' presented in TS p16, lines 20 to 38. (Government of Australia)	accept. Text to be revised.
TS-686	A	36	9	36	10	twice change "range approximately from" to "approximately range from" (Government of The Netherlands)	accept
TS-687	A	36	14	36	17	Again and again: in the use of electricity transports and industry sectors are addressed but building sector is not …Why? (Jacques Rilling, CSTB Building Research Center)	comment does not appear to refer to text reference.
TS-688	A	36	15	0	0	the minimum potential is 529 MtCO2eq! (GRAPE model) (0 0, IPCC TSU WGIII)	reject. Refers to different target.
TS-689	A	36	16	36	16	Include analog information for 3-4W/m2, add after "mitigation.": "The same picture shows across all of the models assessed in the 3-4 W/m2 stabilization target range, with the potential for near term greenhouse gas mitigation in the electricity supply sector ranging up to over 11,000 MtCO2eq." (Government of German Federal Environment Ministry)	reject. Excess detail given space constraints.
TS-691	A	37	0	0	0	Risk management should also take into account that the selection of appropriate adaptation measures needs to also take into account the nature of the adaptation measure ie contribution to ghg emissions. (Government of Australia)	accept. Text to be revised.
TS-	A	37	7	37	19	move to section 2.3 (Page 12)	accept.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
692						(0 0, IPCC TSU WGIII)	
TS-693	A	37	17	37	19	It is suggested to include reference to the underlying chapter of the full report in order to help the reader identify the variety of integrated assessment approaches mentioned in the last sentence of this paragraph. (Government of Austria)	accept. Will add reference toi WGII.
TS-694	A	37	21	37	23	Suggest redraft "With this in mind the question for today's policy makers is not "what is the best climate policy for the next century", rather it is "what is the best climate policy for today given the uncertainty about the long-term goals"". (Government of UK)	accept.
TS-695	A	37	21	37	0	The following text sounds "policy prescriptive": "The issue for today's policy makers is not what the best climate policy is for the next century. It is what the best climate policy is for today given the uncertainty about the long-term goals". Stating "given the uncertainty about the long-term goals" could be interpreted as an excuse by some policy makers to adopt a "business as usual" approach. Furthermore, "the best climate policy for today" also sounds as though the climate policy for today is sufficient and does not need adjustment to meet future goals. Revision of this text to a more neutral wording is suggested. (Government of Japan)	accept. Text to be reworded.
TS-696	A	37	23	36	23	This paragraph does not sufficiently give policy advice on timing of reductions which, however, can be drawn from chapter 3 and should be reflected here. Add after "long-term goals": "Earlier emissions reductions are found optimal to hedge against eventual high climate sensitivity, which is associated with faster and more intense warming. This result is robust to the choice of discount rate and to beliefs about climate sensitivity." as quoted from chapter 3.6.2.1, page 118, line 35. (Government of German Federal Environment Ministry)	accept. Text to be reworded.
TS-697	A	37	28	37	30	Monetising carbon. Worth drawing the distinction between mature and maturing technologies and measures when determining how much it is worth paying for carbon abatement. Technologies which have high carbonsavings potential but require RD&D would justify a higher carbon costs in their RD&D and early deployment phases. (Government of UK)	reject. No basis in the literature.
TS-698	A	37	30	37	30	Is this reference to WG II, Chapter 20, or WG III, Chapter 12? (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	WGII, Ch20.
TS-699	A	37	30	37	30	Which CH 20? (Juan F Llanes-Regueiro, Havana University)	WGII
TS-	A	37	30	37	30	Please check, reference to Ch.20, as AR4 WGIII does not contain Ch. 20.	Reference is to WGII.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
700						(Government of Pakistan)	
TS-701	A	37	30	37	30	Insert "Working Group 2" after "Ch.20". (Government of Australia)	accept.
TS-702	A	37	30	37	30	Is this reference to WG II, Chapter 20, or WG III, Chapter 12? U.S. Government (Government of U.S. Department of State)	WGII, CH20.
TS-703	A	37	35	85	0	The structure of the underchapters about the different sectors should be more uniform, starting with the status of the sector describing emissions, share of global and trends, like it is done in 6. Mitigation options for residential/commercial building. (Government of Norwegian Pollution Control Authority)	Accepted, see
TS-704	A	37	45	37	46	change "developmental status" to "development", insert "local comparative costs of" before "energy resources", delete "available" (Government of The Netherlands)	Accept
TS-705	A	37	45	37	45	The authors should confirm that they mean "region" and not "country". (Government of Australia)	Reject
TS-1520	A	37	48	0	0	The text refers to “energy consumption” but Figure TS18 operates “energy demand”. Suggest harmonizing. (VOLODYMYR DEMKINE, UNEP)	Accept
TS-706	A	37	49	0	0	this information is missing in FigTS18 (0 0, IPCC TSU WGIII)	Reject
TS-707	A	38	2	0	0	the upward trend in Asia is much stronger than in the former S.U., thus having stronger influence on global energy consumption (which is lacking in FigTS18) (0 0, IPCC TSU WGIII)	Reject
TS-708	A	38	4	38	6	Figure TS 18: the authors should explain what region Oceania is included under, or if Oceania has been omitted from the figure. (Government of Australia)	Accept
TS-709	A	38	4	38	6	Figure TS 18: the authors should explain what conversion factors are associated with renewables and nuclear power in determining conversion to common unit. Are they assuming constant energy output etc? (Government of Australia)	Clarify
TS-710	A	38	6	0	0	Figure TS.18. This graph should include a sidenote explaining that the different coloured bars represent year data. (Government of Japan)	Accept
TS-711	A	38	15	0	0	I have made the same point elsewhere. I do not understand this comparison and the units used. While W/m2 makes sense for solar energy, for example, I cannot see	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						how this can be used for a coal deposit, where the units must be in terms of total energy and not power. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	
TS-712	A	38	15	38	16	The text states that "Fossil fuel consumption has increased steadily during the past three decades (Fig TS .19). Nuclear has slowed since the 1980s and large hydro and geothermal are relatively static." This could give the misleading impression that nuclear consumption has reduced. The text should be clear, for example "Nuclear consumption has continued to grow, though at a slower rate than in the 1980s." (Jonathan Cobb, World Nuclear Association)	Accept
TS-713	A	38	17	0	0	The share of fossil fuels dropped from 86% in 1972 to below 80% in 2000, but has since risen again to just over 80%. (Michael Jefferson, World Renewable Energy Network & Congresses)	Reject
TS-714	A	38	17	38	18	rephrase "Wind ... base" to: "Wind and solar have grow relatively very fast, but are presently still marginal." (Government of The Netherlands)	Reject
TS-715	A	38	17	38	21	The authors need to explain if hydro and solar are in the same metric? Is the level of W/m2 correct? In addition the intent and implications of this sentence are unclear, the authors should explain why the distributed nature of renewable energy sources are important. (Government of Australia)	Clarify
TS-716	A	39	0	39	0	Figure TS 19 : The lowest contributors curves cannot be read (Government of France)	Accept
TS-717	A	39	1	39	3	What does “Heat” mean as a fuel source for primary energy? Heat is usually considered to be an energy product, not a source. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Reject
TS-718	A	39	1	0	0	Figure TS.19: The number of graphs do not tally with the symbols for different fuel types. Please check. (Government of Pakistan)	Accept
TS-719	A	39	1	39	3	What does “Heat” mean as a fuel source for primary energy? Heat is usually considered to be an energy product, not a source. U.S. Government (Government of U.S. Department of State)	Accept
TS-720	A	39	2	0	0	Figure TS.19. I am puzzled by this; what does heat mean as a primary energy source? From the text later in the document I deduce that this is waste heat that could be put to good use rather than simply rejected to the environment, but this was not obvious when I saw it here. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-721	A	39	2	39	2	figure TS.19, comment: 'solar photovoltaics', 'solar thermal', 'tidal, wave and ocean', 'wind', do not show in the graph, presumably because these coïncide with 'heat' and 'other fuel sources of electricity'; suggest to cummulate as 'other fuel sources of electricity', and possibly an additional graph within TS.19 with sufficient resolution to be able to see the development of these fuel types (Government of The Netherlands)	Accept
TS-722	A	39	3	0	0	add Figure with energy consumption by sector (0 0, IPCC TSU WGIII)	Accept
TS-723	A	39	7	0	0	use current issue of WEO (2006) (0 0, IPCC TSU WGIII)	Accept
TS-724	A	39	8	39	8	The authors should explain what they view as a "low oil price". (Government of Australia)	Accept
TS-725	A	39	9	39	11	The reference here, implying that tar sands and oil shales will or could make a big difference is highly misleading. With total recoverable resources from sands and shale together of the order of under 700 billion barrels at a very optimistic level would extend the global use of oil by some 10 years. (Michael Jefferson, World Renewable Energy Network & Congresses)	Reject
TS-726	A	39	12	39	12	I wonder if the SRES scenarios and others reviewed in Ch 3 make the assumption that these non-conventional fossil fuels become commercially viable? Is this not an important policy choice whether or not to use these fuels and so should replace "will" if "if" they become commerically exploited (Rachel Warren, University of East Anglia)	Accept
TS-727	A	39	16	39	16	delete "per year" (Government of The Netherlands)	Accept
TS-728	A	39	17	39	17	insert "slightly less then half this amount at" before "around US$280 billion ..." (Government of The Netherlands)	Clarify
TS-729	A	39	19	39	22	The reference to reserves being X5 of total emissions since the industrial revolution needs clarification. It emerges out of the blue. The "hence . . ." doesn't follow. (Government of UK)	Accept
TS-730	A	39	22	39	24	The sentence "Fossil-fuel scarcity, at least ... are likely to peak" should more emphasise relative and absolute scarcities. Therefore the sentence could be extended like this: "Absolute fossil-fuel scarcity, at least at the global level, is therefore not a significant factor in considering climate change mitigation, though debate continues over when conventional oil and gas are likely to peak, which will lead to relative scarcity (when demand exceeds supply)." (Nikolaus Supersberger, Wuppertal Institute for Climate Environment Energy)	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-731	A	39	22	0	0	The proposal that fossil fuel scarcity is not a significant factor mixes up coal, oil (conventional and unconventual), and natural gas resource availability against projected demand in an unhelpful way. There is no coal resource scarcity; there is an impending natural gas scarcity by mid-century; and there is an impending conventional oil scarcity - probably within 20 years - with its forward shadow already apparent. This has implications for climate change mitigation and other issues. This resource issue needs to be distinguished from energy supply security considerations which may encompass politically-motivated disruption, import dependency, exposure to 'accidents', etc.as discussed on page 30, lines 1-4.Also, oil resources have a quite different order of magnitude set of implications for the transportation sector compared to coal and natural gas. (Michael Jefferson, World Renewable Energy Network & Congresses)	Accept - words of explanation needed.
TS-732	A	39	23	39	23	The following wording is suggested: .., though debate continues over when global conventional oil and gas production are likely to peak. (Government of Austria)	Accept
TS-733	A	39	24	40	1	The figure proposed in SPM should be also inculded here. Il the long term (2100) the "peak" will not only occcur for oil and gas, but also for conventional coal. (VARET jacques, French Geological Survey)	Reject
Reject TS-734	A	39	24	40	1	Although the values indicated are valid, there are huge differences between the various fossil resources available. The fact that the most economic resources (notably for oil) tend to be exhausted or at least unsufficient to cover present and coming needs will have a strong impact - already observable - as the "peak" is approached. A table should be added to show the breakdown of fossil fuel resources according to type (oil, gas, coal, unconventional...). This would support a dicussion on the question of the price of oil in the period (2007-2030), and the incidence of sustained high prices (of the order of 100$/bbl) on the carbon emissions scenarii. A specific development should be proposed on coal (the only very large reserves) and unconventional fuels : costs and challenges for CO2 future emissions. Discussion should also precise the risks linked to "ups and downs" in oil prices and the necessity to maintain high prices guarantied on the long term (at national aand regional levels if not global) in order to consolidate alternative investments. (VARET jacques, French Geological Survey)	Reject
TS-735	A	40	1	40	1	The following wording is suggested: .. will drive changes in future energy supply. (Government of Austria)	Accept
TS-	A	40	1	40	1	infuture should be in future	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
736						(Government of France)	
TS-737	A	40	1	40	1	typo, split "in" from "future" (Government of The Netherlands)	Accept
TS-738	A	40	2	40	2	comment: bad language, replace "the policy aim towards" by "more emphasis is put on" and "has grown in importance" by "by policy" (Government of The Netherlands)	Accept
TS-739	A	40	7	40	7	comment: bad language, replace "opens a window of" by "provides" and "for the co-benefits of choices in the energy mix to" by "to choose an energy mix with" (Government of The Netherlands)t	Reject
TS-740	A	40	10	0	0	delete '…potential reductions and costs' from title (0 0, IPCC TSU WGIII)	Accept
TS-741	A	40	12	40	12	Insert "Increasing" before "dependence". (Government of Australia)	Reject
TS-742	A	40	14	0	0	The statement that Europe's carbon emissions are currently stable has little meaning with (since 1990): Austria +22%, Belgium up over 30%, Greece +31%, Iceland +41%, Ireland +67%, Italy +15%, Netherlands +24%, Norway +19.5% and Portugal +51%! (Source: BP 2006) (Michael Jefferson, World Renewable Energy Network & Congresses)	Reject
TS-743	A	40	16	40	16	The authors should confirm that it makes sense to talk about BAU emissions "increasing" rather than "trending upwards". (Government of Australia)	Reject
TS-744	A	40	17	0	0	This does not corresponds with 50-100% on Page 5 (Line16) (0 0, IPCC TSU WGIII)	Clarify
TS-745	A	40	18	40	21	add reference to figures SPM.1 and TS.4 (for which we propose annex NL-1) (Government of The Netherlands)	Reject
TS-746	A	40	23	40	23	Apart from THE VERY (Joe Asamoah, International Energy Foundation)	Reject
TS-747	A	40	26	0	0	FigTS20: total (global) is missing; this Figure belongs to Chapter 1 (unless this is just emissions from energy use) (0 0, IPCC TSU WGIII)	Clarify TSU
TS-748	A	40	31	40	33	The words of "maximum mitigation potentials" are unclear. The words should be consistent with the definitions in TS. p.16. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Accept
TS-	A	40	31	40	31	It is suggested to substitute "good" by "significant".	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
749						(Government of Austria)	
TS-750	A	41	0	41	0	Table TS.9. It is unclear wether heat generation is really included in the numbers. Use of solar thermal energy seems to be missing. (Government of German Federal Environment Ministry)	Accept
TS-751	A	41	1	41	5	The words of "economic potential" are unclear. The potential can be only defined under a paticular level of carbon price or emission reduction. However, the level is not shown. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Accept
TS-752	A	41	4	41	0	Table TS.9 is a reproduction of Table 4.4.4, which is better summarized in Table 4.4.5, where the double-counting has been removed. Since this is a Technical Summary, it would make more sense to use the summary Table 4.4.5, perhaps with a 100$/tonne column added. Also, Table TS9 on pp. 41-42 is difficult to interpret and could use more description/explanation in the table caption. U.S. Government (Government of U.S. Department of State)	Clarify subject to model solution
TS-753	A	41	5	42	15	Table TS.9. It was not clear to me how this data fitted together coherently. Where does the maximum potential in table TS.9 come from? Clearly there will be a range of assumptions in assessing the limits of what the technologies are capable of achieving, "using all efforts". How does this match the figures quoted on p42? For example, nuclear power is shown in the table as being able to deliver 2.85 GtCO2/yr saving, but the text reduces this to 1.0 without explanation. Subsequently I found the origins of the 1.0 number in chapter 4, but there is no cross reference here and it appears out of thin air. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	Clarify subject to model solution
TS-754	A	41	6	0	0	TS.9 estimates should provide information on what fossil fuel prices and availability assumptions were used. The negative-cost nuclear power is somewhat surprising given present market performance of the technology. Also, it is very difficult to make cost estimates for this technology given its low-probability high consequence risks. The table should also explicitly identify which technologies are technically proven and commercially available at this time versus those that are still emerging - particularly relevant for CCS. (Iain MacGill, University of NSW)	Reject
TS-755	A	41	6	42	0	Mitigation technologies; this section and table TS.9 is most important. But the energy supply mitigation opportunities are inadequately described. Additional explanation on what is included in bioenergy (3.09 Gt C02) is needed, particularly with reference to developing countries (2.56 Gt C02)	Reject

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Government of India)	
TS-756	A	41	7	0	0	Table TS9: The costs for fuel switching are most likely too low. See comment (on ch4, pa 82, line 31) above. Probably, the costs are located one or two classes higher. (Walter Ruijgrok, EnergieNed)	Clarify subject to model solution
TS-757	A	41	7	0	0	Table TS9: The consistency of cost ranges for nuclear, hydro and wind should be verified. See comment (ch4, pa 83, line 16) above. (Walter Ruijgrok, EnergieNed)	Clarify subject to model solution
TS-758	A	41	10	42	1	The mitigation potentials shown in this table do not agree with the values given in Chapter 4's Executive Summary, Pg. 5, lines 7-11. This table gives the maximum potential for each technology, but they cannot be added. A much more realistic assessment of mitigation potential in the energy sector is presented in Table 4.4.5 (Chapter 4, Pg. 92). Replace the current Table TS.9 with the information in Table 4.4.5. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accept
TS-759	A	41	10	41	0	Table TS.9: It is suggested to include the whole table on one page. (Government of Austria)	Reject
TS-760	A	41	10	42	1	The mitigation potentials shown in this table do not agree with the values given in Chapter 4's Executive Summary, Pg. 5, lines 7-11. This table gives the maximum potential for each technology, but they cannot be added. A much more realistic assessment of mitigation potential in the energy sector is presented in Table 4.4.5 (Chapter 4, Pg. 92). Replace the current Table TS.9 with the information in Table 4.4.5. U.S. Government . (Government of U.S. Department of State)	Accept
TS-761	A	41	10	42	1	The mitigation potentials shown in this table do not agree with the values given in Chapter 4's Executive Summary, page 5, lines 7-11. This table gives the maximum potential for each technology, but they cannot be added. A much more realistic assessment of mitigation potential in the energy sector is presented in Table 4.4.5 (Chapter 4, page 92). Replace the current Table TS.9 with the information in Table 4.4.5. U.S. Government (Government of U.S. Department of State)	Accept
TS-762	A	41	10	42	0	Table TS9 on pp. 41-42 is difficult to interpret and could use more description/explanation in the table caption. U.S. Government (Government of U.S. Department of State)	Reject
TS-763	A	41	10	41	0	Table TS.9 is a reproduction of Table 4.4.4, which is better summarized in Table 4.4.5, where the double-counting has been removed. Since this is a Technical	Clarify subject to model solution

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						Summary, it would make more sense to use the summary Table 4.4.5, perhaps with a 100$/tonne column added. U.S. Government (Government of U.S. Department of State)	
TS-764	A	41	11	41	0	Table TS 9: The description of "Potential total CO2 emissions saved in 2030" is unclear. What potential do you mean? (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Reject
TS-765	A	41	0	0	0	Table TS.9 is a reproduction of Table 4.4.4, which is better summarized in Table 4.4.5, where the double counting has been removed. Since this is the Technical Summary, it would make more sense to use the summary Table 4.4.5, perhaps with a 100$/tonne column added. (Robert Goldston, Princeton Plasma Physics Laboratory)	Clarify subject to model solution
TS-766	A	42	6	42	21	The role and potential for hydropower is discounted throughout this section. Additional emphasis should be added in the text for the potential of hydropower as a proven low GHG emitting power source. For example, in Africa where less than 10% of the population have reliable access to electric power there is 1,750,000 GWh/year technically proven potential hydro capacity while currently only 76,000 GWh/year is being produced (reference, World Atlas and Industry Guide International Journal of Hydropower and Dams, 2001). This potential was recoginized and emphasized in a Ministerial Decleration of the African Ministerial Conference in S. Africa in March, 2006. A UNESCO report notes "Approximately two-thirds of the economically feasible potential remains to be developed. Untapped hydro resources are still abundant in Latin America, Central Africa, India and China." (Ref: http://www.unesco.org/water/wwap/facts_figures/water_energy.shtml) The same report notes "Hydropower plays a major role in reducing greenhouse gas emissions: developing ½ of the world's economically feasible hydropower potential could reduce greenhouse gases emissions by about 13%." (Jerry Marks, J Marks & Associates)	Accept
TS-767	A	42	6	42	17	I quite agree that we need to develop and to spread renewable energy. However “Nuclear power” and “Carbon capture and storage” are unsafety and uncompleted technology. They should be deleted from TS. (Masatake Uezono, Citizens' Alliance for saving the Atmosphere and the Earth)	Reject
TS-768	A	42	6	0	0	power plants is missing in the table (0 0, IPCC TSU WGIII)	Reject – no table
TS-	A	42	10	42	10	comment: hydrogen is not a primary energy source, but an energy storage and	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
769						transport agent; we suggest to rephrase (Government of The Netherlands)	
TS-770	A	42	13	42	15	delete, and insert numbers in preceeding sentence (more nuclear (1.0 Gt), renewables (1.0Gt), etc.) (0 0, IPCC TSU WGIII)	Accept but avoid duplication
TS-771	A	42	13	42	13	"eq" should not be in subscript form. (Government of Pakistan)	Accept
TS-772	A	42	15	0	0	The take up and timing of CCS deployment seem conservative This may be because it is based on 2004 report (IEA) which may not reflect laterst knowledge of CCS and which pre-dates the Special Report. It should be cross-checked with the Special Report and recent publications (e.g IEA GHG T8 Conference, June 2006).The potential of CCS with EOR which is economically attractive should be given greater consideration. It should further be checked versus current industry plans. I note that there are few CCS experts among the authors and therefore I raise a concern that latest developments in this fast-moving technology are represented. (Government of UK)	Accept
TS-773	A	42	19	42	21	It would be helpful to indicate what this level of CO2 abatement means in terms of figure TS.6. Where does a reduction of 1.3-2.6 Gtonnes CO2eq put the world on the TS.6 probability map? (Government of UK)	Accept
TS-774	A	42	21	0	0	Add: “In the longer term, beyond 2030, much greater supplies of non-C02-emitting energy will be needed, of order 150 EJ/year in 2050, 500 EJ/year in 2100 and 1000 EJ/year in the next century. The total requirement until 2200 is in the range of 100,000 EJ. Table TS 10 provides a perspective on the options to provide these levels of energy.” [Copy corrected version of Table 4.3.1 here.] (Robert Goldston, Princeton Plasma Physics Laboratory)	Reject
TS-775	A	42	22	0	0	Section 4.4: this is not an assessment; quantification? what is the highest risk? (0 0, IPCC TSU WGIII)	Reject – no numbers in actual chapter
TS-776	A	42	23	42	33	They are several ways to write a technical summary, despite the quality of the present version under revision the criterion has been probably to follow up the prescribed chapter organisation. This could be the emphasis in the “technical” ingredient. In these sense the summary is long. Policy makers should have to read almost 130 pages to get an accurate idea of the report. Putting the emphasis in the “summary” ingredient, there are common sections in CHs 4 to 10 that could be summarized : Integrated and non-climate policies can affect emissions of greenhouse gases	Reject – TS must follow actual chapter

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						Interactions of mitigation options with vulnerability and adaptation Technology research, development, deployment, diffusion and transfer Co-benefits of greenhouse gas mitigation policies and links to sustainable development Effectiveness of and experience with climate policies, potentials, barriers and opportunities/implementation issues This option could be stronger than the present one specially because such important issues could be better highlighted with a sectoral perspective. What I suggest is to insert this issues in 11 with a sectoral perspective. If I was supposed to read the Report as a non-expert, I would appreciate that in as much as I hope the suggestion could save some pages. (Juan F Llanes-Regueiro, Havana University)	
TS-777	A	42	26	42	26	It is suggested to insert "conventional and nuclear" before "thermal power plants". (Government of Austria)	Accept
TS-778	A	42	31	42	33	replace by: "Some adaptation to climate change, like air-conditioning and waterpumps, use energy and contribute to higher CO2-emissions, and thus necessitate more mitigation efforts." (Government of The Netherlands)	Accept
TS-779	A	42	35	42	35	typo, change "barrier" to "barriers" (Government of The Netherlands)	Accept
TS-780	A	42	38	42	40	The whole . . . the word "policies" sounds wrong - suggest "reasons". (Government of UK)	Accept
TS-781	A	42	38	42	45	suggest redraft paragraph e.g. "Policies in the short term affect emissions in the longer term. The need for short-term action in order to make any significant impact in the longer term has become apparent, as has the need to apply the whole spectrum of policy instruments; no single policy instrument will enable the desired transition to occur. Large scale energy conversion technologies have a life of several decades and hence a turnover around 1-3% per year. This means that policy decisions taken today will affect the rate of deployment of carbon emitting technologies and hence have profound consequences on development paths, especially in the rapidly developing world." (Government of UK)	Accept
TS-782	A	42	38	42	40	illogic reasoning, one instrument may be sufficient, but effectiveness depends on factors that differ between countries, such as the legislative framework, human capacity and the societal acceptance; suggest to rephrase (Government of The Netherlands)	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-783	A	42	38	43	5	A clearer statement is needed that uncertainty over regulations represents a barrier. U.S. Government (Government of U.S. Department of State)	Accept
TS-784	A	42	38	43	5	A clearer statement is needed that uncertainty over regulations represents a barrier. U.S. Government (Government of U.S. Department of State)	Accept
TS-785	A	42	40	42	40	The references to "short term" should be recast to make clear we need sustained action, at scale, starting now. (Government of UK)	Accept
TS-786	A	42	41	42	41	After 'apparent.', insert: 'This is especially so in regard to the need to develop the new power technologies (essentially carbon capture and storage, solar, fusion and advanced nuclear fission) that can almost completely replace carbon-emitting technologies during the course of this century.' (Ian Cook, United Kingdom Atomic Energy Authority)	Reject
TS-787	A	43	1	43	5	There is no evidence to support the claim that feed-in tariffs are superior to certificate trading systems. Differences in success so far, could easily be contributed to differences in life time of these policies. Feed-in tariffs have been around for some time now, while certificate sytems are fairly new. Moreover, feed-in tariffs have their own difficulties such as adequate tariff setting (to avoid overstimulation and free riding) and adjustment to technology and cost improvements. (Walter Ruijgrok, EnergieNed)	Accept
TS-788	A	43	1	43	3	It is probably too early to say whether feed-in tariffs are superior to green certificate trading. Experience is limited to date and there are a wide range of relevant factors other than the particular scheme design which have determined the relative success of different countries. (Iain MacGill, University of NSW)	Accept
TS-789	A	43	1	0	5	A conclusion is drawn that feed-in tariffs appear to be superior to green certificate trading systems based on quotas. A clarification is needed about superiority. What aspect is meant? When it comes to real market-introduction and environmental effectiveness it might be the case, but concerning cost-effectiveness of reducing GHG emissions, studies have come to the opposite conclusion. (Government of Sweden)	Reject
TS-790	A	43	2	43	2	The word "superior" should be changed into "effective". Feed-in-tariffs are not necessarily efficient in comparison to green certificate trading systems. Superior means better in many aspects. This is not the case, however.	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						(Mitsutsune Yamaguchi, Teikyo University)	
TS-791	A	43	3	43	4	"feed-in-tariffs" and "green certificate trading systems based on quotas" are unknown concepts to us, suggest to use different words (Government of The Netherlands)	Reject
TS-792	A	43	6	0	0	Section 4.6: assessment is missing; in what area(s) can we expect the most promising co-benefits? More about air pollution (megacities!) (0 0, IPCC TSU WGIII)	Accept – subject to changed inn actual chapter
TS-793	A	43	13	0	0	how does this correspond with the $US 16 trillion on Page 39, Line 16? (0 0, IPCC TSU WGIII)	Accept – ensure consistency
TS-794	A	43	13	43	14	comment: mystifying language; suggest to rephrase "Sustainable development policies that match mitigation objectives" to "Some mitigation policies" (Government of The Netherlands)	Accept
TS-795	A	43	15	43	17	delete (duplication with Lines 23-31) (0 0, IPCC TSU WGIII)	Accept
TS-796	A	43	19	43	21	No literature reference is provided in chapter 4 for the finding that liberalisation policies tend to result in a lack of capital investment. The authors should confirm that this finding is not apocryphal and is supported in the literature. (Government of Australia)	Reject
TS-797	A	43	25	43	28	the "co-benefit impact from …. air pollution abatment "; is mentionned without any mention of potential increasing energy consumption due to their application, as it is mentionned in transport fuels specifications improvements (section 5, page 71, lines 15 to 17) BUT TO BE MENTION IN REFINERY SECTION (sem REM nr (13)) (Brigitte POOT, Total s.a.)	Accept
TS-798	A	43	25	43	31	Suggest adding text to address concerns about energy security that can also lead to increased GHG emissions; e.g., increased use of domestic coal supplies to produce liquid fuels for transportation. U.S. Government (Government of U.S. Department of State)	Accept
TS-799	A	43	28	43	0	Suggest adding text to address concerns about energy security that can also lead to increased GHG emissions; e.g., increased use of domestic coal supplies to produce liquid fuels for transportation. U.S. Government (Government of U.S. Department of State)	Accept
TS-800	A	43	28	43	29	Electricity supplied by nuclear energy is also less prone to price fluctuations due to the relative price stability of uranium (versus oil and gas) and because uranium is a relatively small percentage of total operating costs for nuclear (versus coal, oil, and	Reject

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						gas). U.S. Government (Government of U.S. Department of State)	
TS-801	A	43	28	43	29	Electricity supplied by nuclear energy is also less prone to price fluctuations due to the relative price stability of uranium (versus oil and gas) and because uranium is a relatively small percentage of total operating costs for nuclear (versus coal, oil, and gas). U.S. Government (Government of U.S. Department of State)	Reject
TS-802	A	43	30	43	31	replace "creation of additional jobs may result" to "resulting in more jobs" (Government of The Netherlands)	Accept
TS-803	A	43	35	43	35	The statement: "Energy technology research …is a good investment." needs to be amplified. For example, given that Figure TS.16 shows the largest potential mitigation benefit from energy conservation and efficiency, should energy research funding be directed to this category of energy research? Alternatively, since cost reductions in CCS could provide a significant increase in the potential for this option, should the funds be directed to this category? Even within a category of good investments, some are better than others. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Reject
TS-804	A	43	35	43	35	The statement: "Energy technology research …is a good investment." needs to be amplified. For example, given that Figure TS.16 shows the largest potential mitigation benefit from energy conservation and efficiency, should energy research funding be directed to this category of energy research? Alternatively, since cost reductions in CCS could provide a significant increase in the potential for this option, should the funds be directed to this category? Even within a category of good investments, some are better than others. U.S. Government (Government of U.S. Department of State)	Reject
TS-805	A	43	35	43	35	The statement: "Energy technology research …is a good investment." needs to be amplified. For example, given that Figure TS.16 shows the largest potential mitigation benefit from energy conservation and efficiency, should energy research funding be directed to this category of energy research? Alternatively, since cost reductions in CCS could provide a significant increase in the potential for this option, should the funds be directed to this category? Even within a category of good investments, some are better than others. Suggest adding references on "return on R&D", and avoiding policy statements. U.S. Government (Government of U.S. Department of State)	Reject
TS-806	A	43	36	43	36	It is suggested to insert "late" before "1970s". (Government of Austria)	Accept

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
TS-807	A	43	39	43	43	What is the basis for predicting that $8 billion invested in R&D today would yield $200 trillion in cost savings by 2050? What model is capable of foretelling not only whether the R&D is spent wisely today but whether these technologies are actually adopted by the marketplace? Seriously, how can one make a statement like this without pages and pages of assumptions explaining what types of research were supported with this $8 billion (was it devoted solely to Gen IV reactor development, all on solar PV, is it a broad portfolio of energy technologies, was it fundamental basic research or applied technology development and large scale commerical demonstration projects) what kind of climate policy was in place that facilitated the deployment of these technologies? How much of the $200 trillion cost savings were attributable to the R&D investments and how much to the climate policy creating a market for these technologies? Earlier in the TS it was stated that the literature is clear that both "technology push" and "technology pull" are needed, so is this $200 trillion solely do to the technology push of this $8 billion investment today? Delete this passage or do a much better job of explaining the statement made here. (James Dooley, Battelle)	Accept – delete text
TS-808	A	43	39	43	42	The return on investment claimed in this statement is so large as to be unbelievable. The basis for the calculation needs to be explained. The savings appear to come from Figure 3.43, but the text describing that figure does not indicate the cost of R&D need to achieve that cost reduction that generates the savings. Also, comparing the investment to that needed to meet the Millennium Development Goals is meaningless. That sentence implies a tradeoff that should not exist. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accept – delete text
TS-809	A	43	39	43	40	The return of USD 200 trillion seems to be quite high in relation to the investment of USD 8 billion, a factor 25 000 (Government of Norwegian Pollution Control Authority)	Accept – delete text
TS-810	A	43	39	43	41	It is unclear where the finding that a US$8 billion investment today could produce a return of US$200 trillion. The authors should review this statement to ensure that it is supported in the body of the WG3 report. (Government of Australia)	Accept – delete text
TS-811	A	43	39	43	42	The return on investment claimed in this statement is so large as to be unbelievable. The basis for the calculation needs to be explained. The savings appear to come from Figure 3.43, but the text describing that figure does not indicate the cost of R&D need to achieve that cost reduction that generates the savings. Also, comparing the investment to that needed to meet the Millennium Development	Accept – delete text

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						Goals is meaningless. That sentence implies a tradeoff that should not exist. U.S. Government (Government of U.S. Department of State)	
TS-812	A	43	39	43	42	The return on investment claimed in this statement is so large as to be unbelievable. The basis for the calculation needs to be explained. The savings appear to come from Figure 3.43, but the text describing that figure does not indicate the cost of R&D need to achieve that cost reduction that generates the savings. Also, comparing the investment to that needed to meet the Millennium Development Goals is meaningless. That sentence implies a tradeoff that should not exist. U.S. Government (Government of U.S. Department of State)	
TS-813	A	43	42	43	42	After 'met.', insert: 'During the period 2050 to 2100, most plausible stabilisation scenarios require rapid movement towards limiting annual carbon emissions to very low levels, whilst energy consumption continues to grow; it is unlikely that this can be accomplished without very strong efforts to develop and deploy the new technologies that can almost completely replace carbon-emitting technologies during the course of this century. Essentially, these technologies are carbon capture and storage, solar (substituted by other renewables where locally appropriate), fusion and advanced nuclear fission: a summary of the options is shown in Table TS10 (which would be Table 4.3.1 (revised) copied here).' (Ian Cook, United Kingdom Atomic Energy Authority)	Reject – not this chapter
TS-814	A	43	46	0	0	transition: in what direction/sense? Explain (0 0, IPCC TSU WGIII)	Reject – obvious
TS-815	A	43	46	43	46	The transition can be achieved. This is a big statement. It could, quoted out of context, be taken as complacent. What is the justification for this statement? The qualification at the end of that paragraph is good but comes too late to qualify that strong first sentence. Suggest redraft. (Government of UK)	Accept
TS-816	A	43	46	43	46	Delete "The energy systems transition required", which makes little sense and replace it with "The required transition in energy systems". (Government of Australia)	Accept
TS-62	B	43	46	44	4	This paragraph is rather trivial. Suggest to address shortly the transitions in fuels, electricity and heat systems separately, and as a whole. An important message would be that transitioning towards (more) sustainable energy systems requires change management of a complex system consisting of supply, demand, storage and infrastructure technologies, each with its own characteristics that may vary in	Reject

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team (suggestions by TSU in ARIAL)
						time. (Government of European Community / European Commission)	
TS-817	A	44	5	0	0	Section 5 (Transport and its infrastructure) rather amazingly contains absolutely no mention of constraints on conventional oil resources or on recoverable unconventional oil resources. Given the current 96% dependence of the World's transport sector on oil-based fuels this omission, and failure to discuss its implications, is a matter which needs to be rectified. (Michael Jefferson, World Renewable Energy Network & Congresses)	Add some statements in the beginning/ Steve
TS-818	A	44	5	0	0	delete 'and its infrastructure' from the title (0 0, IPCC TSU WGIII)	accepted
TS-819	A	44	9	44	9	in such type of summary, it is confusing to find on two following pages, wording with "28% of world energy use" (page 44) and wording with "24% of word CO2 emissions related to energy use for 2000" (page 45), without mentionning year of inventory for the first occurence while this contribution is clearly increasing rapidly; IN ADDITION THEY ARE CONSIDERED IN THE SAME SENTENCE "21-28%" in section 5 for year 2000 (page 7, line 12-13) see remarks (4 & 10) (Brigitte POOT, Total s.a.)	We will check this.
TS-820	A	44	14	44	15	how compares total transport energy with world transport energy use? (0 0, IPCC TSU WGIII)	Same things
TS-821	A	44	17	0	0	insert after Line 17: Page 46 Lines 9,10,11 (0 0, IPCC TSU WGIII)	Accepted/steve
TS-63	B	44	19	44	21	The description of the modal split for freight transport is a bit too simplistic: it is said that road transport dominates in the EU and Japan while rail transport has a major share in the US. However, in the EU and Japan, maritime transport also has a major share, in contrast with the US. (Government of European Community / European Commission)	Take it in account/koba
TS-822	A	44	20	0	0	leave out: Europe (0 0, IPCC TSU WGIII)	Rejected
TS-823	A	44	21	44	24	This sentence is illustrated by figure TS.21, but absolute figures should be also useful and these data are not available neither in TS, neither is section 5 pages 7- 8 where only the global figures are given in fig 5.1 and table 5.1 (they should be available either via IEA/SMP model, either via UNFCC NIR reports) (Brigitte POOT, Total s.a.)	We will consider/koba
TS-824	A	44	23	0	0	insert 'growing population' between 'with'and 'growing incomes' (0 0, IPCC TSU WGIII)	Accepted
TS-825	A	44	25	44	25	add: "Such modal shifts are counter productive since - as a rule - there is a clean hierarchy of GHG-friendly modes (for goods transport: ship and rail are better then road, air is worst; for passenger transport: walking and cycling are better than public transport, individual motorized transport (cars, airplanes) are worst)" Justification: It is necessary to highlight these general rules which apply practically worldwide.	Rejected, this does not belong here

						(Government of German Federal Environment Ministry)	
TS-826	A	44	27	44	29	Figure TS.21 is not properly formatted and is blurred. Moreover, perhaps something is to be added in braces at the end of Sea in the bottom of the Legend. (Muhammad Latif, Applied Systems Analysis Group)	We will improve/koba
TS-827	A	44	31	44	0	It is inappropriate to conclude from Figure TS.22 that "in developing economies, motor vehicle ownership approaches one per adult." The graph shows a topping out around 810 vehicles per 1000 people, and only the U.S. appears to approaching this level. U.S. Government (Government of U.S. Department of State)	Accepted
TS-828	A	44	31	44	31	It is inappropriate to conclude from Figure TS.22 that "in developing economies, motor vehicle ownership approaches one per adult." The graph shows a topping out around 810 vehicles per 1000 people, and only the U.S. appears to approaching this level. U.S. Government (Government of U.S. Department of State)	Accepted
TS-829	A	45	1	45	5	In Fig.TS.22 one point for each country should make picture more clear (Government of Czech Republic)	Rejected
TS-830	A	45	3	0	0	FigTS22: explain S-curves (0 0, IPCC TSU WGIII)	rejected
TS-831	A	45	6	45	7	modify: Rapid motorization, insufficient emission standards and too long usage of old vehicles has created…. problems in many cities worldwide, leading to …. for tighter emissions standards and, …. Justification: more precise description of situation (Government of German Federal Environment Ministry)	Accepted/steve
TS-832	A	45	9	45	11	future trends? (0 0, IPCC TSU WGIII)	We will add/steve
TS-833	A	45	11	45	11	Transportation and its infrastructure-replace "gotten' with 'become' (Government of Australia)	Accepted/steve
TS-834	A	45	15	45	15	add "Ongoing gradual improvement of fuel efficiency per ton km could not compensate for more and heavier vehicles." (Government of The Netherlands)	Rejected, comments doesn't apply here
TS-835	A	45	21	45	23	arguable opinion, GHG concern may grow to the first rank in less than a few decades. (Government of France)	We will edit/steve
TS-836	A	45	21	45	23	modify: "It is…. reductions will be viewed in conjunction with air pollution and congestion problems. Therefore solutions have to try to optimize on the environmental burden as a whole and not just an GHG-emissions." Justification: more precise description of situation (Government of German Federal Environment Ministry)	Take it in account/steve
TS-837	A	45	25	45	25	in such type of summary, it is confusing to find on two following pages, wording with "28% of world energy use" (page 44) and wording with "24% of word CO2 emissions related to energy use for 2000" (page 45), without mentionning year of inventory for the first occurence while this contribution is clearly increasing rapidly; IN ADDITION THEY ARE CONSIDERED IN THE SAME SENTENCE "21-28%" in section 5 for year 2000 (page 7, line 12-13) see remarks (3 and 10) (Brigitte POOT, Total s.a.)	We will check
TS-838	A	45	25	0	0	this has to correspond with FigTS2 (Page 3)	We need to check it

						(0 0, IPCC TSU WGIII)	
TS-839	A	45	29	0	0	same figures as for energy use (Page 44, Line 15)? (0 0, IPCC TSU WGIII)	Same as the above
TS-840	A	46	4	46	8	Please specify year of emissions - they appear high. (Nick Campbell, ARKEMA SA)	We nee to check it
TS-841	A	46	4	46	7	the range of F-gases contribution of 1,4 and 8,9% should be notified regionally (as figures given in section 5. page 11 lines 1 to 8 clearly detailled the different range in US), or GIVEN GLOBALLY on worlwide basis based on real UNFCC inventories OTHERWISE it should be strange to not find any mitigation measures for non-CO2 emissions of road transport, OR NOT INCLUDED IN LCA fig 5.11. & 5.12 (see remarks 1& 12) (Brigitte POOT, Total s.a.)	Rejected, we don't have data.
TS-842	A	46	5	46	6	Check figures for N2O emission, which are quoted as 2.5 and 2.8% of total GHG emissions on the transport sector. It looks too high. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	We will check/koba
TS-843	A	46	5	46	7	This text indicates that non-CO2 gases account for 4 - 12% of total GHG emissions from the transport sector, but there is no mention of the potential for their mitigation in Section 5 of the Technical Summary. If information on mitigation potential and cost for non-CO2 GHG emissions from the transportation sector is available, it should be included in the Technical Summary. If the information is not available, a statement to that effect should be included in the Technical Summary. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	We will need deeper discussion/Ron
TS-844	A	46	5	46	5	Insert "vehicle" before "air conditioning", as only emissions from vehicular air conditioning should be attributed to the transport sector. (Government of Australia)	accepted
TS-845	A	46	5	46	7	This text indicates that non-CO2 gases account for 4 - 12% of total GHG emissions from the transport sector, but there is no mention of the potential for their mitigation in Section 5 of the Technical Summary. If information on mitigation potential and cost for non-CO2 GHG emissions from the transportation sector is available, it should be included in the Technical Summary. If the information is not available, a statement to that effect should be included in the Technical Summary. U.S. Government (Government of U.S. Department of State)	We will need deeper discussion/Ron
TS-846	A	46	5	46	7	This text indicates that non-CO2 gases account for 4 - 12% of total GHG emissions from the transport sector, but there is no mention of the potential for their mitigation in Section 5 of the Technical Summary. If information on mitigation potential and cost for non-CO2 GHG emissions from the transportation sector is available, it should be included in the Technical Summary. If the information is not available, a statement to that effect should be included in the Technical Summary. U.S. Government (Government of U.S. Department of State)	Same as the above
TS-847	A	46	5	45	7	modify: "CH4 emissions are… 2,8 %. Growing concern is caused by rapidly increasing F-gas emissions which currently account for 1,4 - 8,9 % (all data based…)." Justification: more precise description of situation (Government of German Federal Environment Ministry)	acepted
TS-848	A	46	8	46	11	The authors should explain what the main uses for electricity in the transport sector are (e.g. rail	We need to check this

						transport). In addition it is unclear where this text is derived from, in the body of the report. (Government of Australia)	
TS-849	A	46	9	46	11	move to pPage 44 (0 0, IPCC TSU WGIII)	Accepted, but only the first sentence.
TS-850	A	46	13	50	3	Comment: The chapter focuses on measures and strategies to improve the efficiency of the single modes. It does not consider the potentials of improving the efficiency of the whole transport system across all modes. This would mean to include the measures which encourage modal shift and reduction of the transport demand and give them much more weight in the technical summary to be balanced against the technical efficiency measures. These important strategies are mentioned in a very limited manner – dense urban structures to facilitate effective public transport (page 49 lines 5-18). In chapter 5 of the report could be found some more points which should be also included in the technical summery: Influence of appropriate infrastructure (report: chapter 5.5) urban transport planning, transport demand management, taxation (report: chapter 5.4.1.). Measures to shift freight transport from road to rail and shipping are missed totally. (Government of German Federal Environment Ministry)	We will take it into account.
TS-851	A	46	16	46	21	The production and use of low cost flex-fuel cars should be added. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Rejected. This is not substantial.
TS-852	A	46	16	46	19	"Comment. I suggest to modify the phrase: Significant developments in mitigation technologies since the TAR include the initial market success of hybrid vehicle technology, the development of clean diesel technology, and the institution of significant research, development and demonstration programs around the globe for hydrogen powered fuel cell vehicles. In this way: - Significant developments in mitigation technologies since the TAR include the initial market success of hybrid vehicle technology, the development of clean diesel technology, and the institution of significant research, development and demonstration programs around the globe for hydrogen powered fuel cell vehicles, like the U.S. ones.- Motivation of comment. I think it colud be important to underline into the 4AR WGIII IPCC Report the role of the U.S. President's Hydrogen Fuel Initiative, launched in 2003, the U.S. Policy Energy Act of 2005 (Public Law 109-58, Title VIII Hydrogen) and the recent DOE's Hydrogen Goal-Setting Methodologies Report to Congress (August 2006). From my point of view, the most important aspects of these documents are: For the Energy Policy Act of 2005: The purpose of the act. Section 802 (Purposes) states: The purposes of this title are— (1) to enable and promote comprehensive development, demonstration, and commercialization of hydrogen and fuel cell technology in partnership with industry; (2) to make critical public investments in building strong links to private industry, institutions of higher education, National Laboratories, and research institutions to expand innovation and industrial growth; (3) to build a mature hydrogen economy that creates fuel diversity in the massive transportation sector of the United States; (4) to sharply decrease the dependency of the United States on imported oil, eliminate most emissions from the transportation sector, and greatly enhance our energy security; and (5) to create, strengthen, and protect a sustainable national energy economy. The reports to the Congress and the FCV diffusion goals. Section 811 (Reports): -(a) Secretary.—Subject	rejected

						to subsection (c), not later than 2 years after the date of enactment of this Act, and triennially thereafter, the Secretary shall submit to Congress a report describing— (…) (4) progress, including progress in infrastructure, made toward achieving the goal of producing and deploying not less than— (A) 100,000 hydrogen-fueled vehicles in the United States by 2010; and (B) 2,500,000 hydrogen-fueled vehicles in the United States by 2020; (…). The appropriation. Different Sections (805, 808, 809 and 811) of the Energy Policy Act of 2005 define appropriation for hydrogen and fuel cell RD&D activities for more than 3.2 billion dollars for the period 2006-2010. For the Hydrogen Goal-Setting Methodologies Report to Congress, August 2006: The Technology-Specific 2010 and 2015 research goals. To ensure reliable systems for future fuel cell powertrains with costs comparable to conventional internal combustion engine/automatic transmission systems, the goals are: A) Electric Propulsion System with a 15-year life capable of delivering at least 55kW for 18 seconds, and 30kW continuous at a system cost of $12/kW peak. B) 60% peak energy-efficient, durable fuel cell power system (including hydrogen storage) that achieves a 325 W/kg power density and 220 W/L operating on hydrogen. Cost targets are at $45/kW by 2010 ($30/kW by 2015). To enable the transition to a hydrogen economy, ensure widespread availability of hydrogen fuels, and retain the functional characteristics of current vehicles, the goals are: A) Demonstrated hydrogen refueling with developed commercial codes and standards and diverse renewable and non-renewable energy sources with a cost of energy from hydrogen equivalent to gasoline at market price, assumed to be $2.00-3.00 per gallon gasoline equivalent produced and delivered to the consumer independent of pathway by 2015. B) On-board Hydrogen Storage Systems demonstrating specific energy of 2.0 kWh/kg (6 weight percent hydrogen), and energy density of 1.5 kWh/liter at a cost of $4/kWh by 2010 and specific energy of 3.0 kWh/kg (9 weight percent hydrogen), 2.7 kWh/liter, and $2.00/kWh by 2015. Reference: 1) U.S. President's Hydrogen Fuel Iniziative: Office of the President. Hydrogen Fuel: A Clean and Secure Energy Future. 30 Jan. 2003. Available on the Web at <http://www.whitehouse.gov/news/releases/2003/01/20030130-20.html>. 2) U.S. Policy Energy Act of 2005, Public Law 109-58. 8 Aug. 2005. Available on the Web at <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=109_cong_public_laws&docid=f:publ058.109.pdf>. 3) Hydrogen Goal-Setting Methodologies Report to Congress. U.S. Department of Energy. Hydrogen Program. August 2006. Available on the Web at <http://www.hydrogen.energy.gov/pdfs/goal_setting_report_congress.pdf>." (Mario Valentino Romeri, none - private Italian citizen)	
TS-853	A	46	19	46	0	Need to include hydrogen ICE's -- see comments on Chapter 5. An easy fix is to remove the words "fuel cell" so that the sentence reads "... programs around the globe for hydrogen-powered fuel cell vehicles ..." to "... programs around the globe for hydrogen powered vehicles ..." U.S. Government (Government of U.S. Department of State)	We will ckeck it out/steve
TS-854	A	46	19	46	19	Need to include hydrogen ICE's -- see comments on Chapter 5. An easy fix is to remove the words "fuel cell" so that the sentence reads "... programs around the globe for hydrogen-powered fuel cell vehicles ..." to "... programs around the globe for hydrogen powered vehicles ..." U.S. Government	Same as the above

						(Government of U.S. Department of State)	
TS-855	A	46	21	0	0	We suggest to add: "Regarding non-CO2-emissions mobile air-conditioning systems based on low GWP refrigerants like e.g. CO2 have been developed and will help to significantly reduce GHG emissions in future." (Government of German Federal Environment Ministry)	We will consider to include this in TS and chapter/koba Suzana
TS-856	A	46	23	48	27	Add in a discussion of the potential of PHEVs. U.S. Government (Government of U.S. Department of State)	Rejected, but we will consider to add in chapter.
TS-857	A	46	23	48	27	Add in a discussion of the potential of PHEVs. U.S. Government (Government of U.S. Department of State)	Same as the above
TS-858	A	46	23	0	0	Section 5.3 "Road traffic": for technical information on mobile air-conditioning systems based on low GWP refrigerants we suggest refer to the Special Report on Safeguarding the Ozone Layer and the Global Climate System. (Government of German Federal Environment Ministry)	Same as before
TS-859	A	46	27	46	29	As it stands, this sentence makes it sound like there is very little point to biofuels (Government of UK)	We nee to redraft./suzana
TS-860	A	46	27	45	31	modify: "With regard to corn the production… biomass, so that the balance for sugar cane is much better. However, it… basis" Justification: more precise description of situation (Government of German Federal Environment Ministry)	Same as the above
TS-861	A	46	28	46	29	The authors should review Chapter 5 to ensure that their finding that for ethanol "the costs per tonne of CO2 avoided are high and CO2 reduction is limited compared to gasoline" is reflected in the body of the text. This is an important finding that is particularly categorical and should be well supported. In addition it is important that the authors provide detail of what emissions are encompassed in their figures for biofuels mitigation potential (i.e. is this a full life-cycle analysis?). (Government of Australia)	accepted
TS-862	A	46	29	46	31	There are many expectation that ethanol should be able to provide more than 10% of gasoline replacement. Regarding diesel displacement by biodiesel the expectation is smaller. Nevertheless, it would be useful to present the conclusion using the following sentence: " There are evidences that ethanol based biofuels can displace more than 10% of gasoline while for biodiesel displacing diesel the result may be more modest". This kind of message is important, otherwise the reader may be unable to understand the first paragraph of Page 47. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Same as the above
TS-863	A	46	31	0	0	explain well-to-wheel (0 0, IPCC TSU WGIII)	We will add/koba
TS-864	A	46	31	0	0	associated prices? (0 0, IPCC TSU WGIII)	Same as the above
TS-865	A	47	0	47	0	It would be useful in the discussion on p. 47 to present information regarding how these fuels would be affected by carbon prices. U.S. Government (Government of U.S. Department of State)	Agree, but we don't have enough time to produce those figures.

TS-866	A	47	1	47	5	This assertion that biomass fuels could account for 50% of road transport energy use by 2050 needs to be documented or not accepted. It might be possible in a few countries, but not in most. This 50% figure is not contained in Chapter 5. Figure TS.24 is not in Chapter 5 and it has no relation to the subject of land use in the text. It should not be accepted. Where does the 35% reduction in transport carbon on a well-to-wheel basis come from? Is it for 2050? Is it related to the potential 50% displacement of oil cited in the prior sentence? What % of cellulosic versus corn-based ethanol and sugar does it assume? U.S. Government (Government of U.S. Department of State)	Take it into account/suzana
TS-867	A	47	1	47	5	This assertion that biomass fuels could account for 50% of road transport energy use by 2050 needs to be documented or not accepted. It might be possible in a few countries, but not in most. This 50% figure is not contained in Chapter 5. Figure TS.24 is not in Chapter 5 and it has no relation to the subject of land use in the text. It should not be accepted. U.S. Government (Government of U.S. Department of State)	Same as the above
TS-868	A	47	1	47	4	modify: "However using…. from cellulose or other organic materials, e.g.. relevant for the production of biomethan, which is in CO2-terms the most efficient solution of all known so far, the potential … basis" Justification: biomethan needs to be mentioned (Government of German Federal Environment Ministry)	It is not significant.
TS-869	A	47	4	47	5	The statement "At these levels no limitations due to land needed for food production or protection of biodiversity are expected" referring to the biomass demand needed to produce 50% of the worldwide biofuels cannot be justified. The total amount of biomass needed would be so much that there would not be enough by-products available as feedstock. Energy crop production on a very considerable scale would be necessary leading to land use changes which easily have negative effects on Greenhouse gas emissions and also negative effects on biodiversity and can also lead to competition with food crops. Therefore the statement should be changed to for example "At these levels it should be possible to avoid competition for land for food production or protection of biodiversity if proper measures are taken". (Wolter Elbersen, WUR, AFSG)	We are going to cross-check.
TS-870	A	47	4	47	0	Where does the 35% reduction in transport carbon on a well-to-wheel basis come from? Is it for 2050? Is it related to the potential 50% displacement of oil cited in the prior sentence? What % of cellulosic versus corn-based ethanol and sugar does it assume? This % estimated in Chapter 5 was not found. U.S. Government (Government of U.S. Department of State)	We will check this.
TS-871	A	47	4	47	0	In Chapter 5 the potential for cellulosic ethanol to replace petroleum is cited as 50% to 100%. Line 3 states, 50%; add the 100% back in. U.S. Government (Government of U.S. Department of State)	We will check it.
TS-872	A	47	5	0	0	insert after expected: Present and future (2030) prices of biofuels vs gasoline and diesel prices are given in FigTS24. It can be concluded that… (0 0, IPCC TSU WGIII)	We nee to consider.
TS-873	A	47	6	47	7	It would be useful in the discussion on p. 47 to present information regarding how these fuels would be affected by carbon prices. U.S. Government (Government of U.S. Department of State)	Same comment
TS-874	A	47	6	47	7	In Figure TS.24 some of the colors in the chart are duplicated, making it difficult to distinguish the data	Same comment

						series from each other. U.S. Government (Government of U.S. Department of State)	
TS-875	A	47	9	47	0	In Figure TS24 some of the colors in the chart are duplicated, making it difficult to distinguish the data series from each other. U.S. Government (Government of U.S. Department of State)	same
TS-876	A	47	13	47	15	modify: "further … by 40% or more in a light .. 2030, depending on market adsorption." Justification: The market adsorption is of crucial importance. Currently the market share of these technologies is still very low. (Government of German Federal Environment Ministry)	Rejected, this is misunderstanding.
TS-877	A	47	14	47	15	Ilarify if it is 40% compared to a current model gasoline engine or expected gasoline engine in 2030 (Government of UK)	We will make clear.
TS-878	A	47	16	47	19	comment: we understand the comparison made as from "old" diesel (drivetrains) to new diesel, and subsequently do not understand the following sentence. The 30% fuel efficiency improvement seems to be extremely optimistic. (Government of The Netherlands)	We will clarify with comparison to gasoline.
TS-879	A	47	24	47	26	costs? (0 0, IPCC TSU WGIII)	We will add more information.
TS-880	A	47	25	47	25	after "1 GtCO2eq" add "/year" (Government of The Netherlands)	accepted
TS-881	A	47	25	47	25	add "/year" after "1 GtCO2eq" (Government of The Netherlands)	same
TS-882	A	47	26	47	26	comment: WEO is not explained here and does not appear in the list of abbreviations, we assume it means World Energy Outlook, this abbreviation also appears in TS47 L44 (Government of The Netherlands)	We will do
TS-883	A	48	0	48	0	Fig. TS 25 : Explicit the meaning of WTT and TTW (Government of France)	We will do
TS-64	B	48	0	49	0	In section 5 on road traffic, p. 48-49, it might be worth mentioning that the potential shift from road transport to less energy intensive modes depends not only on the development of public transport infrastructure and on relative prices but also on the quality of service in public transport – which could represent some cheaper potential for emission reductions. (Government of European Community / European Commission)	We will take it into account.
TS-884	A	48	3	48	3	comment: are "stack costs" the same as production costs? (Government of The Netherlands)	Make clear
TS-885	A	48	3	48	0	True for fuel cells but not true for Hydrogen fueled ICE's. Ford and BMW are close to having production vehicles on the road. Ford has a limited (100 or so vehicles) lease program today. Remove the words fuel cell so that the sentence reads "... hydrogen vehicles ..." U.S. Government (Government of U.S. Department of State)	Rejected, unless I get new data.
TS-886	A	48	3	48	3	True for fuel cells but not true for Hydrogen fueled ICE's. Ford and BMW are close to having production vehicles on the road. Ford has a limited (100 or so vehicles) lease program today. Remove the words fuel cell so that the sentence reads "... hydrogen vehicles ..." U.S. Government	same

						(Government of U.S. Department of State)	
TS-887	A	48	5	48	5	Some mention should be made that there are also substantial private funds being spent on development of hydrogen fuel cell vehicles. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	accepted
TS-888	A	48	5	48	5	Some mention should be made that there are also substantial private funds being spent on development of hydrogen fuel cell vehicles. U.S. Government (Government of U.S. Department of State)	same
TS-889	A	48	5	48	5	Some mention should be made that there are also substantial private funds being spent on development of hydrogen fuel cell vehicles. U.S. Government (Government of U.S. Department of State)	same
TS-890	A	48	10	0	0	It is surprising that there is no mention of nuclear power in this section, for the production of hydrogen. It could be used for the essentially carbon free production of hydrogen, either by electrolysis of using high temperature reactors. There is a proposal by the US DOE to construct a prototype high temperature plant for hydrogen production at the Idaho site. There is also considerable interest elsewhere. (Stanley Gordelier, Nuclear Energy Agency of the OECD)	We will add
TS-891	A	48	14	48	15	The text states "In the long-run, if hydrogen could be produced economically from biomass, solar, or wind power, , well-to-wheel carbon emissions could be nearly eliminated." This omits hydrogen production from nuclear energy, either through electrolysis or through the use of process heat for thermochemical production. The potential for nuclear is covered in Figure TS.25 and should be incorporated into the text. Suggest "In the long-run, if hydrogen could be produced economically from biomass, solar, nuclear energy or wind power," (Jonathan Cobb, World Nuclear Association)	accepted
TS-892	A	48	15	48	16	"Comment. The text: -Hydrogen costs are currently estimated to be 2 to 7 times the cost of gasoline (without taxes).- is incoherent with the phrase (Chapter 5, page 35, lines 11-12): -The cost of FCV is estimated to be much higher than the conventional ICE and the retail price of H2 is 2-7 times higher than gasoline.- These hydrogen costs are with or without taxes? Please clarified this aspect and give the appropriate references." (Mario Valentino Romeri, none - private Italian citizen)	We will check/koba
TS-893	A	48	15	48	15	Add after "biomass, solar, or wind power," "or high temperature nuclear reactors" (Government of France)	same
TS-894	A	48	15	48	16	Text: “Hydrogen costs are currently estimated to be 2 to 7 times the cost of gasoline (without taxes).” Suggest to modify the text in this way: “Hydrogen costs are currently estimated to be 1.3 to 3.8 times the cost of gasoline (without taxes).” References: US DOE, Well-to-Wheels Case Studies for Hydrogen Pathways (excluding Wind Centralized) - http://www.hydrogen.energy.gov/well_wheels_analysis.html; EIA Retail Gasoline Prices, 21 August 2006 - http://www.eia.doe.gov/; US DOT FHWA, Gasoline Taxes -http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm; Natural Gas Spot Prices Henry Hub, 21 August 2006 - http://www.wtrg.com U.S. Government (Government of U.S. Department of State)	same
TS-895	A	48	15	48	16	Text: “Hydrogen costs are currently estimated to be 2 to 7 times the cost of gasoline (without taxes).” Modify the text in this way: “Hydrogen costs are currently estimated to be 1.3 to 3.8 times the cost of	same

						gasoline (without taxes)." References: US DOE, Well-to-Wheels Case Studies for Hydrogen Pathways (excluding Wind Centralized) - http://www.hydrogen.energy.gov/well_wheels_analysis.html; EIA Retail Gasoline Prices, 21 August 2006 - http://www.eia.doe.gov/; US DOT FHWA, Gasoline Taxes - http://www.fhwa.dot.gov/ohim/mmfr/mmfrpage.htm; Natural Gas Spot Prices Henry Hub, 21 August 2006 - http://www.wtrg.com U.S. Government (Government of U.S. Department of State)	
TS-896	A	48	17	48	18	The global amount of catalyst (Pt) required by the construction of a fair number of fuel cells would raipdly exhaust the reserves. (Government of France)	noted
TS-897	A	48	19	48	19	Figire TS.25. Full spelling for WTT and TTW please. (Mitsutsune Yamaguchi, Teikyo University)	We will do
TS-898	A	48	19	48	20	Figure TS 25 needs some explanation on the abbreviations used (Gasoline-HV, FC-Gasoline, FC-CO6, etc.). Also the figure should include FC-ethanol, which if produced from sugar cane would result in very low CO2 emission. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	We will do
TS-899	A	48	19	48	19	Figure TS.25: Title on the top of the Figure may be also incorporated, in the title of the Figure at the bottom. Also, there is problem with readability of the text labels on the left of the Figure. The abbreviations WTT & TTW, used in the Legend, also need explanation. (Muhammad Latif, Applied Systems Analysis Group)	We will do
TS-900	A	48	19	0	0	figure TS.25 - define FCV "fuel-cell vehicle"; WTT and TTW as "well-to-tank" and "tank-to-wheels" (Government of UK)	same
TS-901	A	48	19	48	0	Figure TS.25 is not mentioned in the text. It is not the best WTW graph to be in the TS, since it deals with hydrogen FCVs only. A more appropriate graph would be Figure 5.24 from Chapter 5. U.S. Government (Government of U.S. Department of State)	We will consider to improve
TS-902	A	48	19	48	19	Figure TS.25 is not mentioned in the text. It is not the best WTW graph to be in the TS, since it deals with hydrogen FCVs only. A more appropriate graph would be Figure 5.24 from Chapter 5. U.S. Government (Government of U.S. Department of State)	same
TS-903	A	48	20	0	0	FigTS25: present costs of gasoline, gasoline-HV and diese; explain WTT TTW (0 0, IPCC TSU WGIII)	We will do
TS-904	A	48	20	48	20	figure TS.25 contains many abbreviations that are not explained, i.e. HV, FC, Cog, WTT, TTW, FCVs (Government of The Netherlands)	same
TS-905	A	48	23	48	27	The point made in this paragraph is very important. In addition, it may be worth noting that this point speaks to the importance of government policies and social marketing efforts that are designed to offset these market trends (preference for size and performance). U.S. Government (Government of U.S. Department of State)	Noted, but not appropriate here
TS-906	A	48	24	47	25	modify and add: "The preference for …. decades. This trend, fuelled, among others, by misleading marketing strategies needs to be broken. Otherwise, it will… above. Market influencing consumer information legislation is in force in some parts of the world, e.g. in the EU, and needs to be enhanced and	rejected

						fully applied in order to become effective". Justification: The market force need to be more precisely described. (Government of German Federal Environment Ministry)	
TS-907	A	48	26	48	26	Is this trend (preference for power and size) not taken into the baseline? (Government of Norwegian Pollution Control Authority)	yes
TS-908	A	48	27	48	27	we suggest to add "High fuel prices have recently boosted sales of hybrid cars, particularly in the US and Canada. Although the current consumer preference for high fuel efficiency will wear of when the fuel price will remain stable, by that time hybrids may have become the standard." (Government of The Netherlands)	rejected
TS-909	A	48	27	48	0	The point made in this paragraph is very important. In addition, it may be worth noting that this point speaks to the importance of government policies and social marketing efforts that are designed to offset these market trends (preference for size and performance). U.S. Government (Government of U.S. Department of State)	same
TS-910	A	48	28	48	28	add: "Most of the statements made above apply also to heavy duty vehicles. Although more fuel efficient in general since mostly diesel powered, the fuel efficiency of heavy duty can be improved significantly as well, reducing at the save time the emissions of conventional pollutions," Justification: HDV should be explicitly mentioned in the text. As it stands it seems to apply to LDV only. This gap needs to be closed. (Government of German Federal Environment Ministry)	We will address this
TS-911	A	48	29	48	30	modify: “The question of how much transport can be shifted to less energy intensive modes is highly dependent on local conditions but also regional and global conditions.” Justification: e.g. rising oil prices at global scale stimulate the use of more energy-efficient transport modes (see chapter 5, page 71 line 20 to page 72 line 28). (Government of German Federal Environment Ministry)	rejected
TS-912	A	49	1	49	2	Increasing the price of carbon fuels will not likely increase the use of public transit in many, if any, countries. Please provide a source for this or drop it. U.S. Government (Government of U.S. Department of State)	We will check this in the chapter
TS-913	A	49	1	49	2	Increasing the price of carbon fuels will not likely increase the use of public transit in many, if any, countries. Please provide a source for this or delete it. U.S. Government (Government of U.S. Department of State)	same
TS-914	A	49	1	49	1	Do not accept this first sentence. What is the basis for stating that a 10% carbon tax would increase public transport by 1-3?. This was not documented in Chapter 5. U.S. Government (Government of U.S. Department of State)	same
TS-915	A	49	1	49	0	Do not accept this first sentence. A 10% carbon tax would not increase public transport by 1-3% in the U.S. or in many places. This was not documented in Chapter 5. U.S. Government (Government of U.S. Department of State)	same
TS-916	A	49	1	49	2	modify: “Existing studies indicate that increasing the price of carbon fuels by 10% could increase use of public transport by 1-3%, if an attractive public transport system exists.” (Government of German Federal Environment Ministry)	same
TS-917	A	49	2	49	3	Where did this 1% telecommuting figure come from? What time period is involved? Could the number be higher in 2050? This was not mentioned in Chapter 5. U.S. Government	same

						(Government of U.S. Department of State)	
TS-918	A	49	2	49	2	The claim that "Existing studies indicate that increasing the price of carbon fuels by 10% could increase use of public transport by 1-3%" is vague. Is this intended to be a global claim? Or does it refer only to those locations with existing public transport systems? Where did this 1% telecommuting figure come from? What time period is involved? Could the number be higher in 2050? I did not find this mentioned in Chapter 5. U.S. Government (Government of U.S. Department of State)	same
TS-919	A	49	2	49	0	The claim that "Existing studies indicate that increasing the price of carbon fuels by 10% could increase use of public transport by 1-3%" is vague. Is this intended to be a global claim? Or does it refer only to those locations with existing public transport systems? U.S. Government (Government of U.S. Department of State)	same
TS-920	A	49	5	49	17	we suggest to add a sentence on the substantial co-benefits of bus rapid transit systems and smart urban planning e.g. for air quality, and traffic congestion, road safety and mobility for poorer people (Government of The Netherlands)	We will take it into account/ron
TS-921	A	49	5	49	17	Comment: The non-motorized transport (walking and cycling) should be added like it is mentioned in chapter 5 of the report page 72 line 30 to 40 (Government of German Federal Environment Ministry)	We will take it into account/ron
TS-922	A	49	7	49	0	Do not accept that a 10% increase in population density would reduce car us by 0.5 – 9%. This is not found in Chapter 5. U.S. Government (Government of U.S. Department of State)	We will check the numbers and rewite/muro
TS-923	A	49	7	49	7	Do not accept that a 10% increase in population density would reduce car us by 0.5 – 9%. This is not found in Chapter 5. References to peer-reviewed scientific literature are needed. U.S. Government (Government of U.S. Department of State)	same
TS-924	A	49	9	49	0	modify: "In contrast to tram systems, urban rail…. costs". Justification: Low cost of tram needs to be mentioned since "tram" might be considered otherwise as "urban rail" as well (Government of German Federal Environment Ministry)	We will redraft/muro
TS-925	A	49	14	49	14	"cities/regions" should be changed to "city/region". (Government of Pakistan)	accepted
TS-926	A	49	23	49	24	It is suggested to delete "currently unavailable" because such statement from the IPCC would be clearly policy prescriptive unless it can be build on the scientific literature and even than it needs some qualifications (e.g. some studies show that it is unlikely that the aviation sector will introduce such measure without policy intervention). (Government of Austria)	Accepted/peter
TS-927	A	49	23	49	0	This sentence does not make sense given the discussion above it. Do not accept. U.S. Government (Government of U.S. Department of State)	same
TS-928	A	49	30	49	31	Please revise this sentence according to my comment #1 for the same sentence in Chapter 5 Executive Summary. (Michael Danilin, The Boeing Company)	Accepted, we will consider in the chapter./peterN
TS-929	A	49	30	49	0	The 40-50% figure was listed as 30-50% in Chapter 5 on p. 4. Change it in the TS. U.S. Government (Government of U.S. Department of State)	We will check

TS-930	A	49	30	49	30	The 40-50% figure was listed as 30-50% in Chapter 5 on p. 4. Change it in the TS. U.S. Government (Government of U.S. Department of State)	same
TS-931	A	49	31	0	0	add after significantly: 'due to increasing…. (0 0, IPCC TSU WGIII)	noted
TS-932	A	49	35	49	36	The sentence "The GHG reduction potential of such strategies has been estimated at 6-12%." cannot be linked with a similar sentence or similar numbers in the main Chapter 5 text !? (Paul Brok, National Aerospace Laboratory NLR)	We will check/peterN/ron
TS-933	A	49	36	49	36	The authors should reconcile the following numbers with Chapter 5 Executive Summary (p.3,lines 47-48): TS states here that the GHG reduction potential of minimizing taxi time, flying at optimal altitude along great-circle routes, and minimizing holding and stacking around airports is about 6-12%. While the Chapter 5 Execituve Summary gave the values of up to 10% and up to 5%, respectively. (Michael Danilin, The Boeing Company)	accepted
TS-934	A	49	39	49	41	I suggest to drop this paragraph about BWB. Also, the mentioned here value of 50% fuel saving by BWB contradict to the value of 20% cited in Chapter 5 (p.42,l.41). (Michael Danilin, The Boeing Company)	We will check/peterN
TS-935	A	49	39	49	43	It is noted that two concepts are used in those lines: blended wing body and flying wing concept. It is suggested to use the same wording in both sentences and to indicate in brackets the different expression if this is also used. (Government of Austria)	accepted
TS-936	A	49	39	0	0	Literature usually suggests a potential for 20% reduction of fuel consumption for blended wing body aircrafts in comparison to conventional technology in use today. 50% seems very high a figure. (Government of German Federal Environment Ministry)	Noted we will check/peterN
TS-937	A	49	43	49	46	Considering the present high cost of oil it is possible that biofuel blends may be cost effective in countries where ethanol is produced at low cost. I suggest, to remove the statment that mitigation potential of aviation may fall in the category of >100 US$/tCO2eq and say that at oil cost around traditional values (30 to 40US$/bbl) the mitigation cost can be higher than US$100/tCO2eq but at oil cost around US$70/bbl may be cost effective the use of low cost biofuels. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	accepted
TS-938	A	49	45	0	0	this information is useless (0 0, IPCC TSU WGIII)	accepted
TS-939	A	49	45	49	47	Delete this last sentence as it is speculative and provides little relevant information for readers. (Government of Australia)	accepted
TS-940	A	50	1	50	9	qualification of "short-tem" potential available in this section on ships (4-20% for older and 5-30 for new, from IMO) has to be related to the mention of "time required to implement measures on any signficant scale" written in similar section 5 page 46, lines 44-48 and following. Moreover, due to the contreversial discussions available in top page 17 (long-term trends) and all page 47 of section 5, should it be possible to consolidated a table or a figures with various sources of datas mentionned rather to limit summary with a single source (either in TS either in section 5)? (Brigitte POOT, Total s.a.)	First point;accepted, but second point rejected,other literatures not available.
TS-941	A	50	1	50	7	what kind of measures? And what are the costs?	Accepted for the

						(0 0, IPCC TSU WGIII)	measures, cost figure are hardly available in the literatures.
TS-942	A	50	1	50	3	It is suggested to leave out "just" and quote one or two examples for measures: "Since the TAR, an International Maritime Organization (IMO) assessment found that a combination of technical measures could reduce carbon emissions by 4-20% in older ships and 5-30% in new ships by implementing state-of-the-art knowledge, such as hull and propeller design and maintenance." (see chapter 5 page 46 line 48 to page 47 line 4) (Government of German Federal Environment Ministry)	accepted
TS-943	A	50	3	50	4	It is suggested to replace "…depending on….vessels" by examples: "The short-term potential for operational measures, including route planning and speed reduction, ranged from 1-40%" (Government of German Federal Environment Ministry)	accepted
TS-944	A	50	5	50	7	rephrase the sentence: "The study estimated a theoretical maximum reduction of emissions of about 18% by 2010 and 28% by 2020 when all technical measures were to be implemented for the entire world fleet." (Government of German Federal Environment Ministry)	Accepted, but withou t the word theoretical.
TS-945	A	50	6	50	6	rephrase and add: "However, it is expected that total greenhouse gas emissions from the marine transport sector will even increase in the years to come. The reasons are increasing shipping activity, which will offset the technical and operational reduction measures, and a lack of marked-based approaches and policy instruments that will effectively reduce greenhouse gas emissions from shipping in the near future. (Government of German Federal Environment Ministry)	accepted
TS-946	A	50	10	50	10	Comment: We suggest to refer to rail transport in general and not only high speed trains. Commuter trains and freight rail have to be included. (regarding commuter trains see also chapter 5 pages 40 / 41) (Government of German Federal Environment Ministry)	We will add
TS-947	A	50	10	50	11	Comment: the issues increase of occupancy rate, lightweight design for all rolling stock, energy saving driving behaviour and separation of fast and slow trains (different tracks) should be added. (partially mentioned in chapter 5 pages 40 / 41) (Government of German Federal Environment Ministry)	Accepted
TS-948	A	50	10	50	10	add: "Rail transport is a very GHG efficient mode. However, these general advantages are challenged by high-speed train transport. The main…". Justification: There is not only high-speed train service. The general advantage of train transport needs to be mentioned at first place. (Government of German Federal Environment Ministry)	We will consider.
TS-949	A	50	11	50	11	Comment: The UBA estimates the mitigation potential for rail vehicles as follows: 27 % (freight), 19 % (passenger), 2000 to 2010 / Germany (UBA/2003: "Reducing CO2 emissions in the transport sector"<http://www.umweltdaten.de/publikationen/fpdf-l/2607.pdf>). change word: travel = rail transport in general (Government of German Federal Environment Ministry)	Accepted
TS-950	A	50	12	50	0	Change “reliable” to “available”. It is unrealistic to call any of these estimates “reliable’. U.S. Government (Government of U.S. Department of State)	Accepted
TS-951	A	50	12	50	12	Change “reliable” to “available”. It is unrealistic to call any of these estimates “reliable’. U.S.	Same

						Government (Government of U.S. Department of State)	
TS-952	A	50	13	50	13	Add: In addition, eco-driving measures are a very promising opportunity (5 % to 20 % savings, see also chapter 5, page 48). Also refer to "modal shift, chapter 5, page 48. (Government of German Federal Environment Ministry)	We will consider in the other place./muro
TS-953	A	50	15	51	35	The following points are missed: International trade and its influence on freight and passenger transport, policies and measures for rail (see report chapter 5.3.2.) (Government of German Federal Environment Ministry)	Rejecte, we haven't discussed this.
TS-954	A	50	19	50	20	Do not use "land use" in context of transportation - it could be missleading with LULUCF issues (Government of Czech Republic)	Rejected
TS-955	A	50	20	50	20	modify: "Given the positive effects of higher population densities on public transport use, walking and cycling and CO2 emissions, …" (Government of German Federal Environment Ministry)	Accepted
TS-956	A	50	21	50	0	Change "key" to "potentially important". It cannot be "key" (vital), because the necessary carbon reductions could be achieved without land use and transportation planning. U.S. Government (Government of U.S. Department of State)	Accepted,but not potentially.
TS-957	A	50	21	50	22	Change "key" to "potentially important". It cannot be "key" (vital), because the necessary carbon reductions could be achieved without land use and transportation planning. U.S. Government (Government of U.S. Department of State)	same
TS-958	A	50	22	50	22	examples FOR LARGE cities (Joe Asamoah, International Energy Foundation)	Rejected, already in the chapter.
TS-959	A	50	26	50	40	Fuel economy standards or CO2 standards are mentionned without any values or order of magnitude even their are available in section 5.4.1.3 page 58 (see also remark Y), at least as standards, should it be possible to extropolate impacts on emissions as given for energy in figure 5.20 (Brigitte POOT, Total s.a.)	Take it into account and redraft the text in the chapter./steve
TS-960	A	50	26	50	28	As written the sentence could be contradictory. Suggest "Transport GHG emissions are continuing to rise because lower GHG emissions per [unit/kilometre?], driven by improved fuel economy standards or CO2 standards, have not been able to compensate for transport growth" (Government of UK)	We will redraft./steve
TS-961	A	50	26	50	40	In the discussion of fuel economy standards, add in a statement that they can be designed to encourage the use of alternative fuels. U.S. Government (Government of U.S. Department of State)	Rejected
TS-962	A	50	26	50	40	In the discussion of fuel economy standards, add in a statement that they can be designed to encourage the use of alternative fuels. U.S. Government (Government of U.S. Department of State)	Same
TS-963	A	50	26	50	0	A slight update is needed: The US fuel economy standards are differentiated by vehicle class. There are presently two classes: passenger cars and light trucks. In April 2006, the US promulgated regulations that will transition the fuel economy standards for light trucks from a uniform corporate average to a size-based corporate average, with a continuous function prescribing the average standard for vehicles of a given "footprint," i.e., the area described by the length of the wheelbase multiplied by the width of the	We will redraft/steve

						vehicle measured from the centerline of the tires. The corporate average standard is the sales-weighted average of the size-based standards for a company's different products. U.S. Government (Government of U.S. Department of State)	
TS-964	A	50	26	50	26	A slight update is needed: The U.S. fuel economy standards are differentiated by vehicle class. There are presently two classes: passenger cars and light trucks. In April 2006, the U.S. promulgated regulations that will transition the fuel economy standards for light trucks from a uniform corporate average to a size-based corporate average, with a continuous function prescribing the average standard for vehicles of a given "footprint," i.e., the area described by the length of the wheelbase multiplied by the width of the vehicle measured from the centerline of the tires. The corporate average standard is the sales-weighted average of the size-based standards for a company's different products. U.S. Government (Government of U.S. Department of State)	Same
TS-965	A	50	27	50	28	modify: Many industrialized … standards or targets for … vehicles". Justification: EU has no "standard" but a target. (Government of German Federal Environment Ministry)	Rejected
TS-966	A	50	28	50	32	The authors include Australia as an example of a country with fuel economy regulations, but unlike the other countries used, does not provide further specification on the type of standards. It would be helpful if further information was included. (Government of Australia)	We will redraft/steve.ron
TS-65	B	50	33	50	34	The statement on "a nearly universal failure of the market to achieve acceptable fuel economy levels regardless of the widely varying cost of fuel among these countries" seems excessive since car fuel consumption and CO2 emissions vary widely across countries and are clearly correlated with the relative levels of fuel taxes, as acknowledged on p. 51, lines 1-9. Indeed, the notion of "acceptable" fuel economy levels itself varies across countries in view of the fact that some developing countries are subsidising fuels. (Government of European Community / European Commission)	Same
TS-967	A	50	38	50	40	While it is true that fuel economy standards direct the tradeoff between fuel economy on one hand and weight and performance on the other, this does depend on the design of the standards. A weight-based structure might be less successful at achieving this objective. U.S. Government (Government of U.S. Department of State)	Same
TS-968	A	50	38	50	40	While it is true that fuel economy standards direct the tradeoff between fuel economy on one hand and weight and performance on the other, this does depend on the design of the standards. A weight-based structure might be less successful at achieving this objective. U.S. Government (Government of U.S. Department of State)	Same
TS-969	A	50	40	50	40	add: "The overall effectiveness of such policies can be significantly enhanced if combined with fiscal incentives and consumer information, e.g.. as laid down in the EU strategies on CO2 & cars". Justification: The package character ("pull and push") measure should be highlighted (Government of German Federal Environment Ministry)	Same
TS-970	A	50	43	0	0	give examples (0 0, IPCC TSU WGIII)	We will give cross-reference to the text in the chapter/muro

TS-971	A	51	4	51	6	This sentence overstates the clarity of the relationship between price and fuel consumption, and may be overly optimistic about the ability of fuel price increases to reduce demand. It is true that -0.06 is a consensus estimate of the long-term elasticity of demand with respect to price. Nevertheless, it is worth noting the following points: (1) This is a long-run figure; in the short-run, the elasticity is more like -0.03 to -0.06; hence, it may take several years to realize these gains. (2) Recent experience in the US casts doubt on these figures; in the past 8 years, retail fuel prices in the US have nearly tripled, yet transportation sector petroleum consumption has increased on the order of 10 percent. (3) This points to the importance of income, among other things on these demand elasticity figures; as income grows, fuel price increases will be expected to have less impact on fuel consumption. U.S. Government (Government of U.S. Department of State)	We will check./ron
TS-972	A	51	4	51	6	This sentence overstates the clarity of the relationship between price and fuel consumption, and may be overly optimistic about the ability of fuel price increases to reduce demand. It is true that -0.06 is a consensus estimate of the long-term elasticity of demand with respect to price. Nevertheless, it is worth noting the following points: (1) This is a long-run figure; in the short-run, the elasticity is more like -0.03 to -0.06; hence, it may take several years to realize these gains. (2) Recent experience in the US casts doubt on these figures; in the past 8 years, retail fuel prices in the US have nearly tripled, yet transportation sector petroleum consumption has increased on the order of 10 percent. (3) This points to the importance of income, among other things on these demand elasticity figures; as income grows, fuel price increases will be expected to have less impact on fuel consumption. U.S. Government (Government of U.S. Department of State)	same
TS-973	A	51	8	51	9	this will depend strongly on scale and type of measures! (0 0, IPCC TSU WGIII)	We will redraft/peterZ
TS-974	A	51	8	51	9	Without stating the amount of the tax, it is meaningless to give a level of reduced private car use. Do not accept this. U.S. Government (Government of U.S. Department of State)	Same
TS-975	A	51	8	51	9	Without stating the amount of the tax, it is meaningless to give a level of reduced private car use. Do not accept this. U.S. Government (Government of U.S. Department of State)	Same
TS-66	B	51	12	51	21	In the analysis of potential emission reduction from the implementation of taxes or emission trading to the aviation sector, it should be specified that the studies results quoted (such as the ICAO study) are dependent on the main assumptions on fuel prices and the target set for the sector. Also, the relative proportions of emission reductions which would be due to reduced air travel and to technical and operational changes depend on the time horizon of the analysis, as demand impacts are expected to dominate in the short term while technical changes should become more important in the long term with the fleet renewal. (Government of European Community / European Commission)	Accepted
TS-976	A	51	17	0	0	reduced air travel is not credible (0 0, IPCC TSU WGIII)	Rejected, but rephrase/ron
TS-977	A	51	24	51	26	IPCC (1999) never claimed that RFI for aviation could be as high as 4. See my comment #31 and please revise this sentence accordingly. (Michael Danilin, The Boeing Company)	Rejected

TS-978	A	51	24	51	25	which impacts/effects? On what? (0 0, IPCC TSU WGIII)	Accepted/ron
TS-67	B	51	30	51	35	Why mentioning only emission trading for marine transport? Other economic instruments (such as fuel taxes) and regulatory instruments might be considered as well. (Government of European Community / European Commission)	Accepted
TS-979	A	51	33	51	35	The authors state that including international shipping in IET could be promising but that the implications of such an approach are untested. As the implications of the approach are untested it seems strange that the authors can make the judgement about the proposals promise. Suggest deletion of this sentence. (Government of Australia)	Accepted
TS-980	A	51	36	52	0	Section 5.5: elaborate more on air pollution abatement in mega-cities (0 0, IPCC TSU WGIII)	We will take it into account/Jorge
TS-981	A	51	37	0	0	Section 5.5: We suggest to add some information on policies to implement the Montreal Protocol which influenced the use of GHGs (CFCs) as refrigerants. This would be in line with section 6.8. (Government of German Federal Environment Ministry)	We will consider/Jorge
TS-982	A	51	47	0	0	example? (0 0, IPCC TSU WGIII)	
TS-983	A	52	0	52	5	suggest redraft "Alternatively, greatly increased energy efficiency of vehicles could postpone such a transition and increase the use of biofuels and energy carriers such as electricity or hydrogen. The transport sector could be directed towards a low-carbon future if these energy carriers were obtained from fossil fuels with carbon capture and storage." (Government of UK)	rejected
TS-68	B	52	1	52	1	It should be specified whether the estimate of 1% of GDP for transport subsidies includes indirect subsidies such as tax exemptions. (Government of European Community / European Commission)	Accepted,we will check/ron
TS-984	A	52	6	0	0	Section 5.6: weak; assessment? Priority setting? (0 0, IPCC TSU WGIII)	We will relocate this section. We won't set priority.
TS-985	A	52	9	52	0	After "electric " add "and plug-in hybrid". U.S. Government (Government of U.S. Department of State)	Accepted
TS-986	A	52	9	52	9	After "electric " add "and plug-in hybrid". U.S. Government (Government of U.S. Department of State)	Same
TS-987	A	52	13	52	13	Insert the word "conventional" in front of oil. Unconventional oil is likely to contribute most to the replacement of conventional oil in the short to medium term. A distinction needs to be made between these two resources. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accepted
TS-988	A	52	13	52	13	Insert the word "conventional" in front of oil. Unconventional oil is likely to contribute most to the replacement of conventional oil in the short to medium term. A distinction needs to be made between these two resources. U.S. Government (Government of U.S. Department of State)	Same
TS-989	A	52	13	52	13	Insert the word "conventional" in front of oil. Unconventional oil is likely to contribute most to the	Same

						replacement of conventional oil in the short to medium term. A distinction needs to be made between these two resources. U.S. Government (Government of U.S. Department of State)	
TS-990	A	52	14	52	15	Suggest redraft "The prospect of current high oil prices continuing, and considerations about import dependence has led to…" (Government of UK)	Accepted
TS-991	A	52	16	52	18	are "oil sands" and "tar sands" the same? If so perhaps use one (Government of UK)	Accepted
TS-992	A	52	17	52	19	Is it possible to capture and store carbon emissions from transport? (Government of Norwegian Pollution Control Authority)	Noted
TS-993	A	52	19	52	19	"addition" should be replaced by "additional". (Government of Pakistan)	Accepted
TS-994	A	52	22	52	52	Figure TS 26 legend quotes Advanced Biofuels. I understand that this is consequence of some study from where the figure was imported. There is no reason to believe that such level of GHG emission can´t be obtained from conventional biofuels, in particular, ethanol from sugarcane and biodiesel from oil palm. Probably, the expeculation on advanced biofuels deals with the potential availability of such large amount of biofuel derived essentially from sugar cane or palm oil. But the way Figure TS 26 is presented provides misleading information to the reader. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	noted
TS-995	A	52	25	0	0	figure TS.26 needs better labeling - does not mention transport (Government of UK)	Accepted
TS-996	A	52	26	0	0	TSFig26: add to title: …from the transport sector (0 0, IPCC TSU WGIII)	Accepted
TS-997	A	52	26	52	26	figure TS.26, comment: this is a very interesting graph, however the scenarios have an unexpected order (e.g. how could advanced biofuels have less emissions than zero-carbon hydrogen fuel cells; this is probably due to differences between the scenarios that are not self-explainatory from their names; it is requested to specify a bit more (Government of The Netherlands)	We will reexamine the usage of this graph and elaborate some comments on this, also we address fuel economy potential.
TS-998	A	52	26	52	26	Fig TS.26 should include PHEVs. Figure TS.26 is just one of many scenarios. In fact, it is probably one of the least likely scenarios since it has over 60% of the carbon reduction coming from biofuels, which is not very realistic. U.S. Government (Government of U.S. Department of State)	Same as the above
TS-999	A	52	27	52	0	Figure TS.26 is just one of many scenarios. In fact, it is probably one of the least likely scenarios since it has over 60% of the carbon reduction coming from biofuels, which is not very realistic. If Figure 5.26 is revised as suggest in a later comment, it would be a better graph is show here. U.S. Government (Government of U.S. Department of State)	Same as the above
TS-1000	A	52	27	52	0	Fig TS.26 should include PHEVs. U.S. Government (Government of U.S. Department of State)	Same

TS-1001	A	53	0	61	0	In General: The summary is quite concise. It preferences efficiency in building stock first (that could be more extensive), claims integrated planning. Heat pumps got to high attention regarding the ecological problems concerning electricity generation. (Government of German Federal Environment Ministry)	Noted. No action required.
TS-1002	A	53	1	0	0	delete from title: 'Mitigation options for (0 0, IPCC TSU WGIII)	Sorry, mistake. Title is correct. Withdrawn
TS-1003	A	53	5	0	0	why not for 2004 (see Page 3)? 33% is far too high compared with FigureTS2! (0 0, IPCC TSU WGIII)	Will check if 2004 is possible. Agreed,TS2 should use grouping as discussed in chapters and in potential calculations to be consistent.
TS-1004	A	53	5	53	12	suggest redraft "The buildings sector was responsible for 7.85 GtCO2 emissions in 2002, 33% of the global total [is this from energy use?]. Carbon dioxide emissions from energy use in buildings grew at an annual rate of 1.8% from 1971 to 2002, this is about equal to the overall growth rate of CO2 emissions from all uses of energy over the period. Between 1971 and 2002 CO2 emissions from residential buildings increased by an average of 1.4% per annum, and those from commercial buildings by 2.2% per annum. During the past five years since the TAR, the increase in CO2 emissions from residential buildings has grown slower than the long-term average at 0.1% per year while those from commercial buildings have grown more rapidly at 3.0% per year." [if kept, it is 0.8 percentage points – not 0.8%]; [what is the current split in emission residential and commercial?] (Government of UK)	Accepted. Text changed, except that we do not understand the last point.
TS-1005	A	53	5	53	5	The following wording is proposed: Globally, the buildings sector ... (Government of Austria)	Rejected, Global is already included in sentence.
TS-1006	A	53	5	53	6	The statement "The buildings sector was responsible for 7.85 Gt carbon dioxide (CO2) emissions in 2002." looks right. How is it compatible with the less than 4 Gt CO2 eq value read on the figure TS 2? (Government of France)	Accepted. TS2 needs to change.
TS-1007	A	53	5	53	6	The authors should specify if this figure includes energy/ electricity consumption in buildings (Government of Australia)	Accepted. We clarified.
TS-1008	A	53	7	53	7	Typo error: "CO2emissions" should read "CO2 emissions" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted, changed.
TS-1009	A	53	9	53	9	Typo error: "CO2emissions" should read "CO2 emissions" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted, changed.
TS-1010	A	53	9	0	0	Delete: During the past five years (0 0, IPCC TSU WGIII)	Accepted, changed.

TS-1011	A	53	9	53	9	"during the past five years" should be replaced for "since the TAR" (Government of Czech Republic)	Accepted, changed.
TS-1012	A	53	16	53	16	Typo error: "CO2emissions" should read "CO2 emissions" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted, changed.
TS-1013	A	53	19	53	22	The value of 1.5 Gt CO2 eq refers to ALL halocarbon emissions from these uses in 2002 not 2020. The typographical error must be corrected and the text would benefit from a list - The IPCC estimates that about 60% of the CFC, HCFC and HFC emissions (1.5 Gt CO2 eq) in 2002 were due to refrigerants and blowing agents for use in buildings (refrigerators, air conditioners and insulation). (Archie McCulloch, Marbury Technical Consulting)	Accepted. Date changed. We do not understand the suggestion on the "list". We Have checked the 1.5 figure, and it is correct (1.4 – 1.5) for buildings, and 2.5 for all uses.
TS-1014	A	53	19	53	23	The term "halocarbons" includes CFCs and HCFCs - this must be noted. Not clear which emissions will stabilise. Last sentence should reference reason as IPCC/TEAP Special report. (Nick Campbell, ARKEMA SA)	Accepted.
TS-1015	A	53	20	53	20	typo: 2020 should be 2002. U.S. Government (Government of U.S. Department of State)	Accepted. Changed.
TS-1016	A	53	21	53	23	Halocarbons are discussed elsewhere in this report, e.g. in Chapter 7, but the mitigation of halocarbon emission from the building sector is not. This is a major omission, since these are emissions that can be relatively easily be controlled at low cost. 1.5 GtCO2-eq. is more than 10% of total GHG emission from the building sector. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accepted. Will add a short summary. MARK
TS-1017	A	53	21	53	23	What is meant by this sentence in the TS ? (Government of France)	Accepted. Corrected to "here"
TS-1018	A	53	21	53	23	Halocarbons are discussed elsewhere in this report, e.g. in Chapter 7, but the mitigation of halocarbon emission from the building sector is not. This is a major omission, since these are emissions that can be controlled relatively easily at low cost. 1.5 GtCO2-eq. is more than 10% of total GHG emission from the building sector. U.S. Government (Government of U.S. Department of State)	Accepted. Will add a short summary.
TS-1019	A	53	22	53	23	Clarify reference (Government of UK)	Accepted, added.
TS-1020	A	53	22	53	23	It is suggested to substitute "elsewhere" by the exact reference (e.g. chapter ….. Of the TS or the underlying report). (Government of Austria)	Accepted, added.
TS-1021	A	53	23	53	24	The phrase "even though they are of considerable significance" is incorrect. Figure TS.1 actually shows the Kyoto Protocol fluorocompounds to be barely discernible in the total and insignificant, in a mathematical sense, in view of the uncertainty in estimates of the emissions of other Kyoto compounds.	Rejected. 1.5 as compared to 7.9 can be considered significant.

						(Archie McCulloch, Marbury Technical Consulting)	
TS-1022	A	53	23	0	0	elsewhere: where? (0 0, IPCC TSU WGIII)	Accepted, added.
TS-1023	A	53	23	53	23	please specify where halocarbons are dealt with (Government of The Netherlands)	Accepted, added.
TS-1024	A	53	27	53	27	It is suggested to insert "are expected to" before "rangte from". (Government of Austria)	Accepted. Changed.
TS-1025	A	53	28	0	0	34% seems too high (0 0, IPCC TSU WGIII)	Rejected. WEO figures report as high as 42%!
TS-1026	A	53	35	53	35	why "over 28-year period"? / replace e.g. by 2030 (Government of Czech Republic)	Accepted. Changed.
TS-1027	A	54	0	54	0	figures TS.27 and TS.28: It would be interesting to learn whether or not the scenarios described take into account the change in energy demand induced by the expected climate change (e.g. more energy required during summer time, less heat required during winter time in many regions). (Government of Austria)	Noted. The scenarios do not specify this.
TS-1028	A	54	0	54	0	Figure TS.27: It is noted that in this figure for the first time in the TS the term "marker scenario" has been used. If the concept of marker scenarios is to be used by WG III this should be used in all sectors but not only in chapter 6. (Government of Austria)	Accepted. Changed.
TS-1029	A	54	0	54	0	figure TS 27: Please, explain "LBNL modifications" and include some reference (to the underlying chapter of the main report). (Government of Austria)	Accepted.
TS-1030	A	55	5	55	7	The part of the sentence "as well as changes in the demand for energy services provided by these equipment and for heating and cooling" seems difficult to understand. (Government of Norwegian Pollution Control Authority)	Accepted, changed.
TS-1031	A	55	5	55	7	unclear sentence, requires rephrasing (Government of The Netherlands)	Accepted. Changed.
TS-1032	A	55	8	69	40	Comment: Measures to shift freight transport from road to rail and shipping are missed totally. (Government of German Federal Environment Ministry)	Misplaced comment. Should be dealt with inCHapter 5.
TS-1033	A	55	14	55	14	It is suggested to insert "compared to BAU scenarios" before "can be achieved". (Government of Austria)	Accepted. Changed.
TS-1034	A	55	19	55	19	It is suggested to substitute "first cost" by "investment costs". (Government of Austria)	Accepted. Changed.
TS-1035	A	55	27	55	27	It is suggested to substitute "real" by "actual economic". (Government of Austria)	Rejected. The group prefers the word “real”.
TS-1036	A	55	30	0	0	to add: "and efficient market tools like ESCOs for existing buildings improvement" (Jacques Rilling, CSTB Building Research Center)	Rejected. Here policies are not singled out .

Comment [TC1]: This comment should be forwarded to CH5.

TS-1037	A	55	30	55	30	Table TS.10.: It is suggested to be more specific with regard to space heating systems. E.g., does this include substitution of fossil fuels by biomass? (Government of Austria)	Rejected. This is a summary table pulling together many types of measures into common categories. No studies have identified substitution of household fossil fuels by biomass among the most cost-effective measures.
TS-1038	A	56	3	56	3	what about no-cost energy-efficiency improvements? (Joe Asamoah, International Energy Foundation)	Accepted. The word “negative” added.
TS-1039	A	57	11	57	11	"requires" should be replaced by "require". (Government of Pakistan)	Rejected. Grammar was correct.
TS-1040	A	57	11	0	0	add: "In the German speaking countries so-called Passive Houses reach a consequently minimized space heating demand by additional costs of only 10% of the total." [CEPHEUS Hanover 2001, p. 82] (Government of German Federal Environment Ministry)	Noted. The text now contains added reference to little extra cost, but not to this level of detail.
TS-1041	A	57	26	57	27	underpinning? (some figures) (0 0, IPCC TSU WGIII)	Rejected. Unfortunately no space here for detailed underpinnings, see main chapter.
TS-1042	A	57	27	57	27	add: "For colder climates, the CO2-balance depends strongly on the CO2-intensity of the electricity production (Aebischer et al., 2006, Figure 5; http://www.cepe.ch/research/projects/projections/IEECB%2706_paper_Aebischer_9-3-06.pdf)." (bernard aebischer, ethz)	Accepted. Text now includes reference to fuel sources.
TS-1043	A	57	31	57	35	Gas fuelled Absorption Chiller-Heater using heat recovered from CHP could be added to the technologies to supply increasing demand for cooling.. This technology is now widely used to meet the cooling demand in Japan. (http://www.tokyo-gas.co.jp/techno/rd/energy_conv_e.html) (Satoshi Yoshida, The Japan Gas Association)	Rejected. The writing group does not agree on whether it is among the technically best responses, while acknowledging that the method has been successful in some countries.
TS-1044	A	57	49	57	49	Delete "new" - there is no innovation that is not new, so the word is redundant. (Archie McCulloch, Marbury Technical Consulting)	Accepted, done.
TS-1045	A	58	2	0	0	I see two indicators (0 0, IPCC TSU WGIII)	Accepted, changed.
TS-1046	A	58	2	58	2	not clear which three indicators are mentioned (Government of Czech Republic)	Accepted, changed.
TS-1047	A	58	4	58	4	"... the cost per ton of CO2..." It is important to use the metric system through out the paper. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted, changed.
TS-1048	A	58	12	0	0	The rating of Energy efficiency certificate schemes as having hig effectiveness and cost-effectiveness is questionable given our very limited experience and mixed results to date with such schemes. For example, the UK EEC has worked well but had almost no trading while the Demand Side Abatement arrangements of the NSW	Rejected. The problem of limited evidence is documented in the paper; and here we report results of best practices.

						GGAS scheme are problematic. The major problem is setting baselines from which 'additional' energy efficiency can be credited. See MacGill et al, ERGO discussion paper on EECT schemes available at www.ceem.unsw.edu.au for more details. (Iain MacGill, University of NSW)	
TS-1049	A	58	12	58	0	Table TS 11: I cannot understand the column of "Cost-effectiveness". It is very unclear. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Accepted. Explained.
TS-1050	A	58	12	0	0	TableTS11: what are the barriers? very little contrast is unlikely. Kyoto Protocol flexible mechanisms: please specify (0 0, IPCC TSU WGIII)	Partially accepted. Flex mex spelled out. We do not understand "what are the barriers? very little contrast is unlikely"
TS-1051	A	58	12	58	15	Table TS.11: The authors provide little detail about the methodology of the Table and in particular how the judgements on the effectiveness were made. It seems to be based on Table 6.5 which provides more relevant detail, and which provides a better discussion of the methodology used to construct the Table. the authors should at the least, provide a reference to table 6.5 (Government of Australia)	Accepted. Explaned that Table 6.5 is the Basis.
TS-1052	A	58	14	58	14	Table TS. 11. Definition of "cost-effectiveness" is necessary. Readers wonder how cost effective these policies are. For example $30/tCO2 is considered cost-effective? (Mitsutsune Yamaguchi, Teikyo University)	Reject. The term is defined in a qualitative sense. Explained in more detail in Table 6.5.
TS-1053	A	58	14	58	14	table TS.11, ESCO is not explained not in the abbreviationslist, please write in full (we know what it is but other may not) (Government of The Netherlands)	Accepted, added.
TS-1054	A	58	21	59	1	major energy-consuming appliances don't give an offset! (0 0, IPCC TSU WGIII)	Rejected. We believe there is a misunderstanding of our use of "offset".
TS-1055	A	59	7	0	0	what kind of programmes? (0 0, IPCC TSU WGIII)	Accepted, this part of the sentence deleted.
TS-1056	A	59	13	0	0	no new section (0 0, IPCC TSU WGIII)	Accepted, subtitle deleted.
TS-1057	A	59	17	59	17	economies in transition not to be mentioned in subparagraph 6.6 (Developing countries) (Government of Czech Republic)	Accepted; the reference to developing countries deleted.
TS-1058	A	59	21	59	24	move to Line 45 (after MD Goals) (0 0, IPCC TSU WGIII)	Rejected. The team feels it is best here.
TS-1059	A	59	31	59	31	It is suggested to substitute "chief" by "most relevant". (Government of Austria)	Accepted, changed.
TS-1060	A	59	31	59	31	comment: rather weak description of synergies, suggest to replace "can be identified" by "exists" (Government of The Netherlands)	Accepted, changed.

Comment [TC2]: Please explain

Comment [TC3]: Please specify

TS-1061	A	59	36	59	36	It is suggested to insert "which are" before "scarce and declining". (Government of Austria)	Accepted, changed.
TS-1062	A	59	37	60	10	With regards to co-benefits of GHG mitigation in terms of a diminished impact on local/regional air pollution, analysis presented in this draft appears to understate the impact that these measures/efforts may pose in improvements of air quality in large cities, particularly those from the developing world, suffering severe air pollution problems. In this respect, not only transport related sources are relevant, but also other sectors of emitters, such as commercial or residential, may provide a contribution.. (Government of Chile)	Accepted, added.
TS-1063	A	60	6	60	6	New jobs may be created but are they displaced old jobs? Are they additional or new ? (James Curran, Scottish Environmental Protection Agency)	Accepted, the word "net" added.
TS-1064	A	60	14	60	20	This is an accurate and succinct treatment of the findings of SROC. (Archie McCulloch, Marbury Technical Consulting)	Thank you!!!
TS-1065	A	60	14	60	15	Term "halocarbon" should be replaced by CFCs and HCFCs. Text is accurate. (Nick Campbell, ARKEMA SA)	Accepted, changed.
TS-1066	A	60	16	60	16	It is suggested to substitute "contributors to global climate change" by "greenhouse gases". (Government of Austria)	Accepted, changed.
TS-1067	A	60	16	60	16	comment: we miss the important notion that the MP does not regulate emissions from banks, and recovery and destruction of halocarbons from some banks, notably cooling systems, would be a low-cost GHG emission reduction measure, but may not be accounted for under the UNFCCC that does not apply to Montreal Protocol substances. (Government of The Netherlands)	We need to check wether comment is correct. Mark tries to find out; if not, we will ask Lambert.
TS-1068	A	60	18	60	19	suggest add name of IPCC SR "… The IPCC Special Report, Safeguarding the Ozone Layer and the Global Climate System, has identified…" (Government of UK)	Done.
TS-1069	A	60	18	60	19	Reference for Special Reports on Ozone ….. should be formalized. (Government of Czech Republic)	Done.
TS-1070	A	60	19	60	20	replace HFC….CFCs by: emissions of fluorinated gases (ODS substitutes, controlled under the K.P.) without ….of ODS gases like CFCs (0 0, IPCC TSU WGIII)	Reject. We do not unnecessarily want to introduce a lot of new jargon, and we like the original text better therefore.
TS-1071	A	60	22	60	22	It is suggested to substitute "designed for objectives unrelated to greenhouse gas emissions" by "not also addressing climate change issues". (Government of Austria)	Rejected, we prefer this wording.
TS-1072	A	60	24	60	24	It is suggested to substitute "encourages" by "may result in". (Government of Austria)	Accepted, changed.
TS-	A	60	26	60	26	It is suggested to delete "impat" before "transport".	Deleted.

1073						(Government of Austria)	
TS-1074	A	60	33	60	34	The following wording is proposed: … and integrated design practices. This points to the need for strengthening policies to promote their deployment. (Government of Austria)	Accepted, changed.
TS-1075	A	60	37	60	37	It is suggested to substitute "phase change" by "improved". (Government of Austria)	Rejected. We need the specificity.
TS-1076	A	60	39	60	39	It is suggested to substitute "coolth" by "cooling". (Government of Austria)	Accepted, changed.
TS-1077	A	60	43	60	43	It is suggested to insert "those new" before "technologies". (Government of Austria)	Accepted, changed.
TS-1078	A	61	3	61	3	It is suggested to delete "that" before "mitigation". (Government of Austria)	Accepted, changed.
TS-1079	A	61	6	61	6	It is suggested to substitute "equipment change-out" by "renewal of equipment". (Government of Austria)	Accepted, changed.
TS-1080	A	61	6	61	6	It is suggested to delete "a" before "ambitious". (Government of Austria)	Accepted, changed.
TS-1081	A	61	8	61	8	The word "in" should be inserted before "Table TS.11". (Government of Pakistan)	Accepted, changed.
TS-1082	A	61	10	61	11	leave out: although….the market (duplication) (0 0, IPCC TSU WGIII)	We do not understand the comment.
TS-1083	A	61	11	61	11	It is suggested to substitute "so" by "to". (Government of Austria)	Accepted, changed.
TS-1084	A	61	24	61	24	It is suggested to insert "are" before "likely". (Government of Austria)	Rejected.
TS-1085	A	61	31	61	31	An explanation of the scope of the Industry sector is necessary to allow readers of the TS to quickly determine the relevance of the chapter to their activities. (Government of Australia)	reject (already covered)
TS-1086	A	61	32	61	37	The terms 'Industry' and 'Industrial Sector' need definition just to make the point clearer. (Government of Australia)	reject
TS-1087	A	61	36	0	0	51%: which year? (0 0, IPCC TSU WGIII)	Reference to 2002 should be evident.
TS-1088	A	61	43	61	47	give some numbers (%) (0 0, IPCC TSU WGIII)	Data not available.
TS-1089	A	61	46	61	47	The following wording is suggested: .. countries to improve energy efficiency and achieve emissions reductions. (Government of Austria)	Accept.
TS-1090	A	61	49	63	8	This material is showing much overlap with Chapter 9. I imagine Chapter 9 has been involved in writing the text for this section?! I think you may still be able to take out some redundancy by referring to other text in the report.	Not relevant for Chapter 7. Refers to another chapter.

						(Eveline Trines, Treeness Consult)	
TS-1091	A	62	1	62	3	"Mitigation options in the forestry sector may be categorized as those that (1) avoid emissions such as from deforestation, (2) sequester carbon through forestation, and (3) substitute for energy intensive materials or fossil fuels." IS THIS CONSISTENT WITH THE CATEGORIES USED BY CHAPTER 9? PLEASE, CHECK. (Eveline Trines, Treeness Consult)	Not relevant to this chapter. Refers to another chapter.
TS-1092	A	62	1	61	3	give some numbers (cap., 5 energy use) (0 0, IPCC TSU WGIII)	Don't understand the comment.
TS-1093	A	62	3	62	3	The following wording is suggested: .. shares, especially in many developing countries. (Government of Austria)	Accept.
TS-1094	A	62	7	0	0	this number doesn't correspond with Page 3/TableTS2 + add: …% of the global total (0 0, IPCC TSU WGIII)	LP will check.
TS-1095	A	62	7	62	13	rearrange this para: 1) Total GHG emissions…2) Most of the industrial sector's CO2... 3) Energy-related CO2 emissions... 4) In 2002 develope nations…5) Industry also emits… (0 0, IPCC TSU WGIII)	Accept.
TS-1096	A	62	10	62	12	suggest redraft "…In 2002 developed nations accounted for 53% of total emissions and developing nations for 47% (see table TS.12). Most of the CO2 emissions from the industrial sector are from energy-intensive industries:…" (Government of UK)	Noted. Lump with A-1095.
TS-1097	A	62	15	62	15	The only industrial process described in the chapter is that of HCFC-22 manufacture which produces HFC-23. Would suggest a change replacing "HFCs from chemical processes" with "HFC-23 from the manufacture of HCFC-22". (Nick Campbell, ARKEMA SA)	Accept. Will also change in Chapter 7.
TS-1098	A	62	16	0	0	modify after processing;SF6 from use flat panel screens (liquid crystal display) and semi-conductors, magnesium die casting, many military applications, electrical equipment, aluminium melting, nuclear fuel cycles, medical applications and many others, and CH4....Justification: This enumeration relects the order of importance as emission sources. For an overview of currently known SF6 applications pls.refer to the new IPCC 2006 Guidelines for National GHG Inventories-Volume 3-IPPU(Industrial Processes and Product Use)-Chapter 8--Other Product manufacture and Use -particularly Chapters 8.3 and 81. and 8.2. (Friedrich Plöger, Siemens AG)	Add if space allows.
TS-1099	A	62	18	62	18	It is suggested to delete "is" before "was". (Government of Austria)	Accept.
TS-1100	A	62	18	62	18	The word "is" appearing between the words "sources" and "was" needs to be deleted.	Accept.

						(Government of Pakistan)	
TS-1101	A	62	19	62	20	evidence and agreement level has not been done in other parts of TS (Government of UK)	To be considered
TS-1102	A	62	20	63	10	The authors should provide some explanation as to the differing figures for tables TS12 and TS13, while it is recognised that one is CO2 and one is CO2 and Non-CO2, the authors should explain the differences in actual and projected emissions. (Government of Australia)	Consider in editing.
TS-1103	A	62	21	0	0	TableTS12: conclusions? (growth 1971-1990, 1990-2002,+ causes) (0 0, IPCC TSU WGIII)	Space does not allow detailed discussion.
TS-1104	A	62	25	0	0	T. Bruulsema: SRES-B2 and -A1 scenarios are not defined or explained in the document. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Accept
TS-1105	A	62	25	62	25	It is suggested to substitute "Emissions projections" by "Emission projections". (Government of Austria)	Accept.
TS-1106	A	62	28	0	0	slow-down of growth in Centrally Planned Asia? Is that plausible? (0 0, IPCC TSU WGIII)	That's what's in the SRES scenarios.
TS-1107	A	62	29	62	29	It is suggested to insert "down" before "to an average annual rate". (Government of Austria)	Accept
TS-1108	A	62	31	62	32	The following wording is suggested: For non-CO2 GHG emissions from the industrial sector by 2020, emissions are projected to increase globally by a factor of 1.8, (Government of Austria)	Accept
TS-1109	A	63	3	0	0	what causes that factor 8? (0 0, IPCC TSU WGIII)	Start from a very low base.
TS-1110	A	63	7	63	7	Remove "source" from table header (Government of Australia)	Accept
TS-1111	A	63	10	64	27	Has chapter 8 been involved in this? I think you may still be able to take out some redundancy by referring to other text in the report. (Eveline Trines, Treeness Consult)	Not relevant to this chapter. Refers to another chapter.
TS-1112	A	63	11	63	11	Section 7.3. There are also great opportunities in cross sector implementation strategies. For example, the increasing use of lighter weight materials such as aluminium in light transportation vehicles offers the opportunity to reduce CO2 emissions through better fuel economy. Recyle rates are also high for these vehicles, greater than 90% in most locations, and recycling aluminium results in 95% GHG emissions reduction -- and, the material can be recycled indefinitely without loss in material properties. (Jerry Marks, J Marks & Associates)	Rejected. Inappropriate detail for TS.
TS-1113	A	63	14	0	0	insert energy intensity before emissions intensity (0 0, IPCC TSU WGIII)	Accept.
TS-	A	63	15	0	0	Delete sentence "Not in the text so either..."	Accept.

1114						(Government of Spain)	
TS-1115	A	63	16	63	17	delete (0 0, IPCC TSU WGIII)	Accept.
TS-1116	A	63	16	63	17	It is suggested to inclde a reference to the Chinese report and to delete the sentence: Not in the text so either we keep this drop the example. (Government of Austria)	Ref. to Chinese eff. in Chapter 7. Delete sentence.
TS-1117	A	63	16	63	17	By the IPCC practice the reference is needed! (Government of Czech Republic)	Ref. is in the Chapter.
TS-1118	A	63	17	63	17	Sentence "Not in the text ... example" should be removed. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accept.
TS-1119	A	63	17	0	0	T. Bruulsema: "Not in the text so either we keep this drop the example." does not appear to be intended as part of the text. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Accept.
TS-1120	A	63	17	63	18	Change beginning of sentence to "The aluminium industry reported >70% reduction in PFC emission intensity over the period 1990-2004…" (Robert Chase, International Aluminium Institute)	Accept. Change will be made in the chapter.
TS-1121	A	63	17	63	17	To be cleaned (Government of France)	Accept.
TS-1122	A	63	18	63	18	The reduction in PFC emissions should be changed from >60% to >70%. Reference available from www.world-aluminium.org, IAI 2004 Anode Effect Survey, 2005. (Jerry Marks, J Marks & Associates)	Accept. Change will be made in the chapter.
TS-1123	A	63	19	0	0	T. Bruulsema: "the ammonia industry reported >50% reduction in energy intensity for 1960 to present" - Smil, 2001 "Enriching the Earth" page 130 Figure 6.12 suggests global average energy intensity declined from 68 to 42 GJ per tonne of NH3 - this would be slightly less than 50%. It could also be noted that since the best modern plants achieve an efficiency of 26-28 GJ per tonne, a mitigation opportunity exists in continuing to modernize ammonia production facilities around the world. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Accept.
TS-1124	A	63	22	0	0	diffusion (instead of use) (0 0, IPCC TSU WGIII)	Accept.
TS-1125	A	63	23	63	23	It is suggested to substitute "these sectors" by "SMEs". (Government of Austria)	Consider in editing.
TS-1126	A	63	25	63	27	Here measures and technologies to reduce GHG emissions are grouped into categories. The reduction of non-CO2-GHGs, e.g. as mentioned in line 17-18 for the aluminum industry, is not covered by the given categories. Add an appropriate category. (Government of German Federal Environment Ministry)	TS-1126- 1151 and TS-71 (Page 157) all deal with Table TS.14

TS-1127	A	63	26	0	0	T. Bruulsema: Mentions fuel switching, and most of the examples in Table TS.14 show switching to natural gas. An assessment on this scale should at least mention the recent shortage of natural gas in North America, and the resulting price increase, which limits the availability of this mitigation opportunity for the future (unless new natural gas resources are developed). (Ben Muirheid , International Fertilizer Industry Association (IFA))	Inappropriate for this discussion. Supply and price are barriers, but do not change potential.
TS-1128	A	64	0	65	0	Table TS14. It should be mentioned under renewables in the Non-Ferrous row that hydropower is the predominate source of electic power used for primary aluminium production. Many new facilities are being built based on renewable hydro power. (Jerry Marks, J Marks & Associates)	Rejected – goes beyond scope of Table.
TS-1129	A	64	1	0	0	Table TS14, 7th column, last row. What is the meaning of LLDPE. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted. Terminology is in chapter.
TS-1130	A	64	1	0	0	Table TS14, 3rd column, 3rd row. It is necessary to explain what BF means. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accepted. Terminology is in chapter.
TS-1131	A	64	1	0	0	Table TS14, 2nd column, 2nd row: Typo error: "Motor systems.Efficient boilers" should read "Motor Systems. Efficient boilers" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Correct in editing.
TS-1132	A	64	1	0	0	Table TS14: Row 3 (Iron and Steel), Column 7 (Product Change): The development of higher strength steels has resulted in improved energy efficiency in products containing steel (for example by enabling the manufacture of lighter weight cars). This is a benefit for our customers. While during the life of the product these steels yield an overall balance of advantage for the environment, for the steel maker the manufacturing process is in fact more energy intensive. (Jean-Pierre Debruxelles, EUROFER)	Noted
TS-1133	A	64	1	0	0	Table TS14: Row 3 (Iron and Steel), Column 6 (Feedstock Change): Switching from iron to scrap also requires a technology change (i.e. replacing the blast furnace/basic oxygen converter route with the electric arc furnace route) There is insufficient scrap in the world to allow companies to make this switch – in fact there is only enough scrap for about one-third of the world's steel needs to be met by this process. The rapid growth in steel consumption in the developing world can only be met by an increasing use of iron and coking coal used in the BF/BOS route. (Note: while there is also a degree of opportunity for blast furnace/basic oxygen producers to substitute the use of virgin raw materials with scrap, this does not alter the fact that availability of steel scrap is limited and finite.) (Jean-Pierre Debruxelles, EUROFER)	Reject. Scrap supply is growing. Chapter does not suggest that scrap route can supply whole world's need.
TS-1134	A	64	1	0	0	Table TS14: Row 3 (Iron and Steel), Column 2 (Energy Efficiency): Scrap pre-heating, while improving energy efficiency, has other environmental implications which make it unsuitable for use in populated locations.	Reject. Newer technology controls other emissions.

						(Jean-Pierre Debruxelles, EUROFER)	
TS-1135	A	64	1	0	0	Table TS14: Row 3 (Iron and Steel), Column 3 (Fuel Switching): While the injection of plastics in the blast furnace can replace other sources of carbon, in Europe at least there is other legislation (e.g. the waste incineration directive) which inhibits the take-up of this practice. Whether using plastics as a fuel substitute reduces GHG emissions is debatable: plastics, more often than not, are landfilled and therefore do not end up as GHG. If they are burned in modern incinerating plants, the energy they generate is recovered. The potential for using waste plastics (e.g. Shredder Residues) in the Steel Industry is very limited: the potential compared to the fossil fuel consumption is probably at the level of a few %. Composition is the main cause for the limitation, such as phosphorus, zinc and sulphur, and can raise formidable challenges; toxic emissions are also an issue. Waste also replaces waste, not necessarily fossil fuel, so that additivity again is not obvious: animal feed, burned in cement kilns for example, has replaced some of the tyres, as it came with larger subventions! (Jean-Pierre Debruxelles, EUROFER)	Reject. Technology is being used with appropriate limitations. Too much detail for TS.
TS-1136	A	64	1	0	0	Table TS14: Row 3 (Iron and Steel), Column 8 (Material Efficiency): This entry implies that there is scope for improved material efficiency by increasing the recycling rate in the steel industry. In fact, recycling rates are already very high, and in many developed countries exceed 85%. This relates to the fact that steel scrap has for many decades been a valuable raw material, as the primary feedstock for the electric arc furnace process route - see comment no. 3. Comment no. 4 is also relevant with respect to high strength steels. (Jean-Pierre Debruxelles, EUROFER)	Rejected. There is still additional potential.
TS-1137	A	64	1	0	0	"Table TS. 14. Sector of Chemicals at Non-CO2 GHG describes 'Control technology for N2O, PFC, CFC and HCFC.' Q1. I would suggest 'Control technology for N2O, PFC, and HFC' since the IPCC report mainly focuses on 6 GHGs including CO2, CH4, N2O, HFCs, PFCs and SF6. I understand that CFCs and HCFCs are controlled by the Montreal Protocol, although CFCs and HCFCs have higher GWPs. I also know control technology of HCFC means HCFC-22 production which produces a by-product of HFC-23, one of F-gases. Q2. If you want to adopt CFCs and HCFCs in the report, please describe the importance of such substances other than the 6 GHGs, for example, in Chapter 7 Industry." (Koichi Mizuno, National Institute of Advanced Industrial Science and Technology)	Reject. Want to keep general category.
TS-1138	A	64	1	0	0	TableTS14: delete 'not comprehensive' from title (is duplication) (0 0, IPCC TSU WGIII)	Delete “Selected” – keep (not comprehensive).
TS-1139	A	64	1	65	0	Add some discussion: assessment of options in Table14! (most promising ones, most sustainable ones, etc.) (0 0, IPCC TSU WGIII)	Information is in the Chapter. Add if space available.

TS-1140	A	64	1	64	0	Table TS.14: column 7, row 5: Please, include the full wording for LLDPE. (Government of Austria)	Information in the chapter.
TS-1141	A	64	1	64	0	Table TS.14: column 2, row 2: the following wording is suggested: Energy management systems and practices, motor systems, efficient boilers and burners, heat recovery, efficient lighting & HVAC (please include the full wording). (Government of Austria)	Handle in editing.
TS-1142	A	64	1	65	0	Most abbreviations in Table TS.14 need to be explained (Government of Czech Republic)	Handle in editing. Information is in Chapter.
TS-1143	A	64	1	65	0	table TS.14 comment: please explain abbreviations, notably BFK, LLDPE, RTO or add to abbreviationslist (Government of The Netherlands)	Handle in editing. Information is in Chapter.
TS-1144	A	64	1	65	0	Table TS.14. Formatting error -- Title says technologies in italics are under demonstration or development, but nothing in the table appears to be in italics. U.S. Government (Government of U.S. Department of State)	Italics got lost in transmission. Should be added back.
TS-1145	A	64	1	65	0	Table TS.14, Chemicals row, Non-CO2 GHG column. It is unclear what is meant by "Control technology" -- is this a control or limit on the production, technologies for reducing by product emissions during the production, technologies to reduce emissions from end-uses, etc.? For instance, the Montreal Protocol controls the production of CFC and HCFCs, and certain mitigation technologies reduces HFC-23 emissions from HCFC-22 manufacturing, and new system designs limit emissions of any chemical from refrigeration systems. Also, recommend changing list to include HFCs (otherwise, citing CFCs, HCFCs and PFCs leaves a conspicuous gap). Production controls and emission-reduction technologies can apply to HFCs as they do for the other halocarbons. U.S. Government (Government of U.S. Department of State)	Reject change in control technology - common terminology. Accept rest of comment.
TS-1146	A	64	1	0	0	Table TS.14: row 4, column 9: please add: "substitution of SF6"; row 5, column 9: please add: "substitution of e.g. CFCs"; row 9, column 9: please add: "HFC"; (Government of German Federal Environment Ministry)	Accept. Will make change in Chapter.
TS-69	B	64	1	65	0	Table TS.14. Formatting error -- Title says technologies in italics are under demonstration or development, but nothing in the table appears to be in italics. U.S. Government (Government of U.S. Department of State)	Italics got lost in transmission. Should be added back.
TS-1147	A	64	0	65	0	Several technologies referred to for cement in table TS.14 must at best be referred to as " Under demonstartion or developing". They should hence be quoted in italics. This relates to "Fluidized bed kiln" under "Energy Efficiency, "Drying with gas turbine" under "Power Recovery", and "CO2/O2 combustion in kiln" under "CO2 Capture and Storage" (Claude LOREA, CEMBUREAU, The European Cement Industry)	Italics got lost in transmission. Should be added back. Will add CO2/O2 combustion in editing.
TS-	A	65	0	0	0	Table TS.14 should be complemented with the following line: Sector: Electrical	Rejected. Either not in our chapter or too

1148						Equipment--Energy Efficiency: Reduction of electricity transmission and distribution losses---Nil-Nil-Nil---Product Change: Improved tightness. Reduced equipment charges---Material Efficiency: Reduction handling losses, all life cycles---Non-CO2 GHG: SF6---Nil; refer to and list under References: J.Harnisch and S.Wartmann, 2005: Reductions of SF6 Emissions from High and Medium voltage Electrical Equipment in Europe (Friedrich Plöger, Siemens AG)	much detail.
TS-1149	A	65	1	0	0	Table TSM, 4th column, 4th row. What does "RTD - power recovery" means? (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Handle in editing. Information is in chapter.
TS-1150	A	65	1	0	0	Table TSM - Why the sector "Oil Refineries" isn´t included? (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Add to table. Will be done in chapter.
TS-1151	A	65	1	0	0	Table TS14, 6th column, first row. Check "Slegs, pozzolones??" and in the 7th column check "Geopolymers??" (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Rejected. Table is correct.
TS-70	B	66	1	66	9	The figures mentioned (10-30% under $100/tCO2 vs. the figures for the two baseline scenarions do not seem to be consistent. The figures for A1B seem to suggest, the first statement should be 10-30% at costs lower than 50$/tCO2-eq. (Government of European Community / European Commission)	Numbers will be updated in Chapter. Need to clarify text.
TS-1152	A	66	2	66	9	Assumptions and uncertainties must be stated in compliance with TS page 15, line 16. (Nick Campbell, ARKEMA SA)	Handle in editing. Refer to chapter 11 or general statement of definitions and assumptions.
TS-1153	A	66	2	66	9	needs to be rewritten (Lenny Bernstein) (0 0, IPCC TSU WGIII)	Numbers will be updated in Chapter. Need to clarify text.
TS-1154	A	66	2	66	6	comment: the mitigation potential in the first sentence (10-30% at <100$ in 2030) seems inconsistent with that in the second (15-30% at <50$ in 2030) and third (13-33%); please clarify or delete first sentence (Government of The Netherlands)	Numbers will be updated in Chapter. Need to clarify text.
TS-1155	A	66	6	66	7	The suggestion that there is significant mitigation potential in the steel sector is extremely inaccurate. In the integrated blast furnace/basic oxygen route (BF/BOS), the main source of process emissions (which account for the vast majority of CO2 emissions from this route) results from the use of carbon as a reducing agent in the blast furnace. As a result of progressive improvements over the past 50 years, the amount of carbon used today in the blast furnace is very close to its theoretical minimum. There is very little scope for further improvement. A similar situation obtains in the electric arc furnace (EAF). There is a theoretical minimum amount of energy required to melt and refine solid raw material (normally scrap steel) into liquid steel, which again is close to being reached. Further significant reductions in energy consumption and/or carbon emissions will only be achieved with the	Reject. Sector is so large that there is large potential. Current best available technology is factor of 2-3 from thermodynamic limit. Scrap availability growing.

						development of new technologies, research for which is under way, but at a very early stage. It is possible that the suggestion of significant mitigation potential has been based on the (false) assumption that the carbon-intensive BF/BOS process route could be replaced by the EAF route, which uses steel scrap. However there is nowhere near enough scrap available in the world to allow such a switch to take place. (Jean-Pierre Debruxelles, EUROFER)	
TS-1156	A	66	21	66	27	comment: surely the lack of consistent policies that are persistent over many years is an important barrier for industry investments aswell (Government of The Netherlands)	Noted.
TS-1157	A	66	26	66	27	lack of access to information: this seems a non-problem to me… (0 0, IPCC TSU WGIII)	Rejected. Serious problem.
TS-1158	A	66	29	66	36	Not consistent use of voluntary agreements and voluntary actions. (Nick Campbell, ARKEMA SA)	Need to define in glossary and use throughout the report.
TS-1159	A	66	39	0	0	T. Bruulsema: WEC is not defined. (Ben Muirheid , International Fertilizer Industry Association (IFA))	WEC = World Energy Council
TS-1160	A	66	48	66	49	It is suggested to remove "consumer preferences" because they are of no relevance with regard to control of GHG emissions from industry once a decision has been made for a production. (Government of Austria)	Rejected. Industry is often demand driven.
TS-1161	A	67	1	67	1	Typo error (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Handle in editing.
TS-1162	A	67	1	67	2	The following wording is suggested: A drawback to financial invcentives is that they are often also used by investors who would have made the investment without the incentive. (Government of Austria)	Handle in editing.
TS-1163	A	67	1	67	1	The second "are" is to be deleted (Government of France)	Handle in editing
TS-1164	A	67	2	67	2	typo: remove "are" (Government of The Netherlands)	Handle in editing.
TS-1165	A	67	6	67	8	The meaning of this sentence would be clearer if it were phrased: Several national, regional or sectoral CO2 emissions trading systems either exist or are being developed, e.g. in … (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Handle in editing.
TS-1166	A	67	6	67	8	The meaning of this sentence would be clearer if it were phrased: Several national, regional or sectoral CO2 emissions trading systems either exist or are being developed, e.g. in …. U.S. Government (Government of U.S. Department of State)	See TS-1165
TS-71	B	67	6	0	0	Table TS.14, Chemicals row, Non-CO2 GHG column. It is unclear what is meant	Already dealt with Comment

						by "Control technology" -- is this a control or limit on the production, technologies for reducing by product emissions during the production, technologies to reduce emissions from end-uses, etc.? For instance, the Montreal Protocol controls the production of CFC and HCFCs, and certain mitigation technologies reduces HFC-23 emissions from HCFC-22 manufacturing, and new system designs limit emissions of any chemical from refrigeration systems. Also, recommend changing list to include HFCs (otherwise, citing CFCs, HCFCs and PFCs leaves a conspicuous gap). Production controls and emission-reduction technologies can apply to HFCs as they do for the other halocarbons. U.S. Government (Government of U.S. Department of State)	
TS-1167	A	67	7	67	7	UK and Denmark are EU members. Please delete UK and Denmark. (Government of France)	Rejected. National systems instituted before EU system.
TS-72	B	67	8	0	0	The meaning of this sentence would be clearer if it were phrased: Several national, regional or sectoral CO2 emissions trading systems either exist or are being developed, e.g. in … U.S. Government (Government of U.S. Department of State)	See TS-1165.
TS-1168	A	67	15	67	36	Chapter 7.6: It is suggested to address combined heat and power in this chapter. (Government of Austria)	Rejected. In chapter 4.
TS-1169	A	67	15	0	0	Section 7.6: We suggest to add some information on policies to implement the Montreal Protocol which influenced the use/emission of GHGs (e.g. CFCs) in many industry sectors (e.g. production of HCFC 22/emissions of HFC 23). This would be in line with section 6.8. (Government of German Federal Environment Ministry)	Accept
TS-1170	A	67	17	67	24	add: emission reduction by increasing cost-effectivity through energy-efficiency improvement in China (in particular in the period 1985-1995) (0 0, IPCC TSU WGIII)	Rejected. Text discusses policies, not cost-effectiveness.
TS-1171	A	67	18	67	18	can have AN impact (Joe Asamoah, International Energy Foundation)	Accepted.
TS-1172	A	67	34	67	34	development, ETC., which (Joe Asamoah, International Energy Foundation)	Handle in editing.
TS-1173	A	67	37	67	37	It is suggested to substitute "6.7" by "7.7". (Government of Austria)	Accepted.
TS-1174	A	67	37	67	46	Sections 6.7 and 6.8 need to be re-numbered. (Government of Australia)	Accepted.
TS-1175	A	67	40	67	41	this statement needs some further explanation (0 0, IPCC TSU WGIII)	Rejected. More detail than appropriate for TS.
TS-1176	A	67	46	67	46	It is suggested to substitute "6.8" by "7.8". (Government of Austria)	Accept.
TS-1177	A	68	20	68	20	It is siuggested to either delete "consumer acceptance" or to include an example within brackets to clarify the message.	Reject in TS. Add example in chapter is space allows.

						(Government of Austria)	
TS-1178	A	68	22	0	0	missing:section on Long-term outlook/systems transitions (0 0, IPCC TSU WGIII)	Issue for TSU to resolve. Material in chapter.
TS-1179	A	68	23	73	5	Chapter 8: It is noted that in chapter 8 words like forecast (page 69, line 1) or forecast (e.g. page 69, line 18) are used. It is suggested to substitute in general "forecast" by "projection". This is because future emissions are uncertain due to policy decisions at all kind of levels. The wording "projection" indicates that in estimating future emissions various assumptions have to be made with regard to those decisions. In contrats, forecast implies that future emissions are strictly dependent on the current level and that there is no possibility to change future emissions. As "projection" is the wording that is used under the UNFCCC in the context of future emissions this substitution would help the understanding significantly. The current wording may introduce confusion. (Government of Austria)	Accepted. Change "forecast" to "projection"
TS-1180	A	68	25	69	2	Section 8.1 could be significantly shortened for the purposes of the Technical Summary, to simply include the findings that the area of global crop land is expected to continue to grow (with regional differences) out to 2020. (Government of Australia)	Noted. We have considered this and concluded that the current level of detail is appropriate.
TS-1181	A	68	27	68	27	To be clear, "land productivity" should be "crop productivity." U.S. Government (Government of U.S. Department of State)	Partly accept. Since this also covers increases in livestock productivity, we suggest changing to "agricultural productivity".
TS-1182	A	68	28	68	28	To be clear, "agricultural land" should be "agricultural land area." U.S. Government (Government of U.S. Department of State)	Accepted
TS-1183	A	68	30	68	31	Is it true as stated thet the share of animal products in the diet is remaining constant in the developed world (Government of Norwegian Pollution Control Authority)	Noted. Yes (**Daniel M. – can you please check?**)
TS-1184	A	69	2	69	2	This increase will cause a rise in GHG emissions several times stronger, because of the associated emissions from production and transport of both feed and animals. (Government of Norwegian Pollution Control Authority)	Noted. Emission trends and projections are discussed in the following paragraph.
TS-1185	A	69	4	0	0	Section 8.2: illustrate with a figure (0 0, IPCC TSU WGIII)	Accepted. Adopt one of the Chapter 8 figures. (**Daniel M.– which one?**)
TS-1186	A	69	6	0	0	T. Bruulsema: "Agriculture... its net CO2 exchange with the atmosphere is nearly balanced" - this statement appears to contradict Figure TS.2 on page 3 which shows roughly equal GHG emissions from agriculture from CO2, CH4 and N2O. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Accepted. Check figures and resolve in the chapter. **Bob & Henry to examine.**
TS-1187	A	69	6	69	9	Check that the numbers add up - as written they imply that F-gases are the largest non-CO2 contributer by far. I.e if 84% N2O and 47% of CH4 are from agriculture, and Agriculture is 14% of non-CO2 emissions then the vast majority	Accepted. The 14% figure is incorrect. We will cross check sources and correct the value.

						of the 86% of non-CO2 emissions which are not from agricutulture must be F-gases. (Government of UK)	
TS-1188	A	69	6	69	9	It is stated that agriculture accounts for 14 % of anthropogenic non-CO2 emissions. This seems not to be consistent with neither the figures of 84% of N2O and 47 % of CH4 nor the information in TS p 3 line 8 where agriculture's(+forestry) share of global GHGs is estimated to 23%. This comment is the same as to chapter 8 p.2 and 7 Maybe the expression "non-CO2 emissions" should be "GHG-emissions" or "CO2- and non-CO2" emissions (Government of Norwegian Pollution Control Authority)	Accepted. The 14% figure is incorrect. We will cross check sources and correct the value.
TS-1189	A	69	6	69	7	The sentence does not give right information. It should read as "Agriculture accounts for an estimated 14% of total global anthropogenic greenhouse gas emissions, mainly due to emissions of non-CO2 GHGs. Its net CO2 exchange with the atmosphere is nearly balanced." (Government of Finland)	Accepted. The 14% figure is incorrect. We will cross check sources and correct the value.
TS-1190	A	69	6	69	9	Check the figures for CO2-emissions. 1% are at least 400 Mt CO2 eq. On the other hand 40 Mt is a too small number as for example only Germany notifies more than 40 Mt CO2 eq. only from soils. (Government of German Federal Environment Ministry)	Accepted. Check figures and resolve in the chapter. **Bob & Henry to examine.**
TS-1191	A	69	7	0	9	the statement here that 'net CO2 exchange of agriculture is nearly balanced' and constitutes '<1% of anthopogenic emissions' needs clarification if not here in the TS then in chapter 8 itself: see next (Ronald Hutjes, Alterra)	Accepted. We are revisiting the value for soil CO2 emissions which was inserted at the last minute. **Bob & Henry to examine**
TS-1192	A	69	7	69	8	Please note that according to the WG1 assessment (see Table 7.4.2 in chapter 7), agriculture accounts for only about 60% of N2O, but with a very wide band of uncertainty, whereas the TS gives only a single figure with no uncertainty. Please ensure that the way you present figures in the TS does not give a misleading impression of certainty about those numbers and sources, and aim for consistency between reports where possible - or state that the figure used here is based on one single source, and that other sources give other figures - and explain why you chose to use only one single source. Giving 4 significant places (2825 Mt CO2 eq N2O) is clearly not appropriate for a figure that has such a large uncertainty. (Andy Reisinger, TSU IPCC Synthesis Report)	Accepted all comments. We are revisiting emission estimates from agriculture and will include uncertainty ranges.
TS-1193	A	69	8	69	9	Please note that according to the WG1 assessment (see Table 7.4.1 in chapter 7), agriculture accounts for between 40 and 70% of CH4. Average absolute emissions in that table are significantly higher than the single figure provided here, without indication of uncertainty. It is very difficult if two different IPCC reports present different absolute figures with no explanation about the reason for the difference. Please attempt to reconcile or at least explain the differences, and ensure that the way you present figures in the TS does not give a misleading impression of certainty about those numbers. Giving 4 significant places (2778 Mt CO2 eq CH4)	Accepted all comments. We are revisiting emission estimates from agriculture and will include uncertainty ranges.

						is clearly not appropriate for a figure that has such a large uncertainty. (Andy Reisinger, TSU IPCC Synthesis Report)	
TS-1194	A	69	9	0	0	T. Bruulsema: The 40 Mt CO2 eq does not agree with the ~4 Pg CO2 eq shown in Figure TS.2 on page 3. The <1% is therefore also suspect. There should likely be mention here that agriculture is indeed nearly balanced as it is both a large source and sink of CO2, and thus the uncertainty on the net emission of CO2 is large relative to the estimate. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Accepted. We are revisiting the value for soil CO2 emissions which was inserted at the last minute.
TS-1195	A	69	16	0	0	14%: both N2O or CH4? (0 0, IPCC TSU WGIII)	Accepted. The 14% figure is incorrect. We will cross check sources and correct the value.
TS-1196	A	69	17	69	18	move this sentence to Ch9 (0 0, IPCC TSU WGIII)	Accepted. Revise is can be substantiated. **Bob & Henry**
TS-1197	A	69	17	69	22	deforestation emissions are dealt with in the forestry sector, here numbers for emission from agricultaral land use should be given (according to the submitted CRF tables the EU CO2emissions from grassland and cropland amount to 540 Mt CO2 in 2004). delete in line 17 " change, especially deforestation" insert instead "from land use" (Government of German Federal Environment Ministry)	Accepted.
TS-1198	A	69	20	69	21	The following wording is suggested: .., where emissions of agricultural greenhouse gases are expected to continue to decrease, … (Government of Austria)	Accepted.
TS-1199	A	69	22	69	22	It is suggested to substitute "important increases" by "significant increase". (Government of Austria)	Accepted.
TS-1200	A	69	27	69	27	The authors should consider whether the inclusion of a figure for the technical agricultural mitigation potential is misleading. The figures for the economic potential provide a much more useful guide for policy makers and avoid some of the complexities (noted in Chapter 8) about assessing technical potential. (Government of Australia)	Accepted.
TS-1201	A	69	28	0	0	please specify units of economic potentials of 1900 – 2100, 2400 – 2500 (,)	Rejected. The units are specified.
TS-1202	A	70	1	70	5	Table TS 15: The author's should explain why they have altered Table 8.1, for use in the TS. (Government of Australia)	Noted. Figures have simply been rounded to nearest 100 MT CO_2-eq. We will do this also for Table 8.1.
TS-1203	A	70	4	70	5	It should be revealed which potentials are due to emission reduction and and which due to enhancement of removals/carbon sequestration. (Government of German Federal Environment Ministry)	Accepted. We will add a sentence that states that 90% of the total figure is due to C sink enhancement, with 10% from emission reduction of methane and nitrous oxide.
TS-1204	A	70	6	70	6	"Restoration of cultivated organic soils" is mentioned as one of the most prominent mitigation options. This may be true, in cases where only the C stock	Rejected. Even accounting for increased methane emissions, there is a net GHG

						changes are looked at. However, if the restoration consists of raising the water table, the CH4 emissions from the restored areas should be taken into account. Thus measures like afforestation/reforestation would be more efficient. (Government of Finland)	benefit globally. Furthermore, we are comparing in section of the TS only to agricultural mitigation options, not afforestation/reforestation which are discussed in the following section of the TS.
TS-1205	A	70	8	70	8	The authors need to explain why mitigation potential from cropland and grazing land management fall with rise in carbon tax? This puzzle has not been explained anywhere. (figure TS.29) (Government of Australia)	Accepted. This should be explained in Chapter 8. Very high prices assume all measures are implemented. Cropland and grazing land management are the least expensive practices to adopt and are the closet to current practice. At low C prices they are adopted quite extensively, but at higher prices, more expensive measures become viable and are implemented at the expense of CM and GM – therefore at prices of C rising from 20 to 100 USD t CO_2-eq., CM and GM implementation decreases whilst other measures increase. These are outputs from the FASOM model as used by US-EPA (2005) and updated from Lee et al. (2005). (**Action: Add details to chapter and adopt in TS**)
TS-1206	A	70	13	0	0	potential of biomass energy: compared to what? (0 0, IPCC TSU WGIII)	Economic potential at the C prices shown – as defined on page 16 of the TS.
TS-1207	A	70	20	70	20	"……...might also be counted under buildings and transport.". MIGHT: isn't it better to know for sure where it is counted in order to write:'because it is' OR 'is not counted under….'? (Eveline Trines, Treeness Consult)	Accepted. Change "might also be counted under" to "is accounted for in"
TS-1208	A	70	20	0	0	where do we eventually count this potential? (0 0, IPCC TSU WGIII)	Hopefully is appears either in the energy sector, or the user sectors (**cross check with other chapters in NZ – a job for the bioenergy cross cutting group in NZ**)
TS-1209	A	70	20	71	0	Figure TS.29: This figure is difficult to understand. This is because the mitigation potential for the range from 0 to >100 should always be the largest one and the mitigation potential for the range 0 to 20 USD/t CO2 eq the smallest one. It seems that the caption for the range of prices does not match the mitigation potential. The range of prices seems rather to reflect 0 to 20, 20 to 50, 50 to 100 and >100 USD/t CO2eq. (Government of Austria)	Accepted. This should be explained in Chapter 8. Very high prices assume all measures are implemented. Cropland and grazing land management are the least expensive practices to adopt and are the closet to current practice. At low C prices they are adopted quite extensively, but at higher prices, more expensive measures become viable and are implemented at the expense of CM and GM – therefore at prices of C rising

							from 20 to 100 USD t CO_2-eq., CM and GM implementation decreases whilst other measures increase. These are outputs from the FASOM model as used by US-EPA (2005) and updated from Lee et al. (2005). (**Action: Bruce will add wording to Chapter 8 and we will adopt it in TS**)
TS-1210	A	70	21	0	0	fig TS29 legend apprears to be not correct. Should be 0-20; 20-50; 50-100 and >100 ?! (Ronald Hutjes, Alterra)	Rejected – but change legend to explain
TS-1211	A	70	21	70	21	figure TS.29, the legenda suggests cumulative data (0-20, 0-50, 0-100) but the bars show subsequent cost categories, please correct (Government of The Netherlands)	Accepted. This should be explained in Chapter 8. Very high prices assume all measures are implemented. Cropland and grazing land management are the least expensive practices to adopt and are the closet to current practice. At low C prices they are adopted quite extensively, but at higher prices, more expensive measures become viable and are implemented at the expense of CM and GM – therefore at prices of C rising from 20 to 100 USD t CO_2-eq., CM and GM implementation decreases whilst other measures increase. These are outputs from the FASOM model as used by US-EPA (2005) and updated from Lee et al. (2005). **Bruce to add some words**.
TS-1212	A	70	21	71	2	Figure TS. 29: The authors should explain why they have altered Figure 8.6 (by excluding an assessment of the potential mitigation for bioenergy), for use in the TS. If it is because they see the potentiality for biofuels as misleading, this should be reflected in Chapter 8, to ensure consistency across the WG3 report. (Government of Australia)	Taken into account. Bioenergy was included in Ch8 simply to show the potential of bioenergy relative to other agricultural measures. Since bio-energy fossil fuel savings are accounted for in the user sector, they are not included here to avoid double counting.
TS-1213	A	70	0	71	0	T. Bruulsema: Figure TS.29: This figure should include an estimate of the potential contribution of yield improvement through plant breeding, in addition to the management options given. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Taken into account. This is already included under the agronomy option of cropland management so this appears in the cropland management activity bar (there are 59 practices so they are aggregated by activity – see Ch8)
TS-1214	A	71	4	71	9	A reflection on uncertainties and non permanence should be added (Government of German Federal Environment Ministry)	Accepted. Add under long term outlook.
TS-1215	A	71	6	0	9	..much of the mitigation potential is derived from soil C accrual….' . In this	Taken into account. See comment TS-1214.

						paragraph a statement should be included that reads something like: "As soil-C accrual is a highly assymetrical process (slow in/fast out) the permanence of this potential in practice is very poor." (Ronald Hutjes, Alterra)	
TS-1216	A	71	19	0	0	discuss a couple of those strategies (0 0, IPCC TSU WGIII)	Accepted – give a couple of examples.
TS-1217	A	71	22	0	0	The importance of the farming system as the decision making unit is not put forward in the TS. It is however crucial for the implementation and success of many of the mitigation options. Sections 8.5 and 8.9 are perhaps the best places to put forward the crucial role in farming systems in the adoption of technology. It is at this level that short and long term decisions are made which also determine the effectiveness of policy measures. (,)	Noted. This is discussed in the barriers section of Ch8 and does not belong here.
TS-1218	A	71	26	0	0	insert 'technical' before potential (0 0, IPCC TSU WGIII)	Accepted.
TS-1219	A	71	31	71	31	Delete "first Commitment Period of the Kyoto Protocol" as this is an unnecessary reference to a political instrument. (Government of Australia)	Accepted.
TS-1220	A	71	37	71	38	The following wording is suggested: .., and contributes to the uncertainty of global emission scenarios. (Government of Austria)	Accepted. Except add the word “projections” after “emissions” and add “FROM AGRICULTURE”
TS-1221	A	71	46	0	0	how does this work out in terms of mitigation? (0 0, IPCC TSU WGIII)	Noted. These are the policies that most reduce GHG emissions and promote soil C sinks but the contribution of these to current emissions cannot be quantified.
TS-1222	A	72	0	0	0	Section 8.9: Long term outlook/systems transitions, the issue of decision making would be useful to incorporate in discussion of the other sectors. (Government of Australia)	Noted.
TS-1223	A	72	1	72	1	Chapter 8.7: This chapter does not address the role of improved (seasonal) weather forecast, improved land-use management practices and might benefit from the contribution of practioners (land-use managers) and their publications in general. (Government of Austria)	Noted. This section is about co-benefits so the comments (referring to technologies to improve implementation) do not belong here.
TS-1224	A	72	12	0	0	T. Bruulsema: Replace "improved cultivars" with "cultivar improvement through plant breeding". The reason is that much of the productivity gain in crop yield has resulted from plant breeding. (Ben Muirheid , International Fertilizer Industry Association (IFA))	Wrong line number. Rejected. The method by which cultivars are improved is not important – only the fact that that they are improved.
TS-1225	A	72	30	73	18	Comment: The chapter should also include the improvement of rail infrastructure as a prerequisite to shift road and air transport (passenger and freight) to rail. Currently in most cases road infrastructure is given priority meanwhile rail infrastructure improves at a much slower rate or even impairs. This encourages to	**This comment does not belong here**. It is addressed to the transport chapter. Wrong page numbers.

						shift much more to road. (Government of German Federal Environment Ministry)	
TS-1226	A	72	35	72	38	This statement should lead to conclusions in estimating mitigation potentials and confidence levels. (Government of German Federal Environment Ministry)	Noted. But - we have assessed these potentials and uncertainties at 2030. In this section we are looking qualitatively at how this may change or relate to the long term estimates of Ch3 – so we cannot quantify further for 2050.
TS-1227	A	72	37	72	37	There seems to be not so much uncertainty with regard to climate changes by 2050, especially with regard to the temperature change. The uncertainty is more significant with regard to changes in precipitation, changes in storm intensity, droughts and floods. It is suggested to include such differentiation. (Government of Austria)	Truncation of comment A TS-1227. See response to full comment below under A TS-1227.
TS-1228	A	72	44	72	45	There seems to be not so much uncertainty with regard to climate changes by 2050, especially with regard to the temperature change. The uncertainty is more significant with regard to changes in precipitation, changes in storm intensity, droughts and floods. It is suggested to include such differentiation. It might also be necessary to differentiate by region, because for some regions there are more studies than for others. (Government of Austria)	Taken into account. Although climate change might be predicted with less uncertainty for 2050 (which we doubt is correct), the impacts of this CC on agriculture is very uncertain – so our statement is correct. The CC impacts and how they manifest (droughts, floods) etc. is not the focus of this chapter (or even this volume 0 such aspects are dealt with by WGII on adaptation).
TS-1229	A	72	44	73	2	add conclusion "more emphasis on emissions reduction from fossil fuel is needed" (Government of German Federal Environment Ministry)	Rejected. This statement cannot come from a single sectoral chapter like agriculture. If such a statement should be made at all, it should be in one of the cross-cutting chapters / statements. Policy prescriptive.
TS-1230	A	72	47	72	48	mention some concrete techn. Improvements (0 0, IPCC TSU WGIII)	Accepted. We will add examples (more C inputs from higher productivity / C input crop varieties or from selective breeding for more resistant material added to the soil)
TS-1231	A	73	4	80	47	comment: although not strictly part of forestry, peatland areas in all climate zones contain large carbon stocks, that are vulnerable to climate change and/or landuse change and their performance as a sink or source (for CO2, CH4 and possibly N2O) may be influenced by their management; this issue seems to be missing entirely (Government of The Netherlands)	accept
TS-1232	A	73	5	80	40	Issue of lack of permanence of forest sequestration should be addressed somewhere in these pages. U.S. Government (Government of U.S. Department of State)	accept
TS-	A	73	11	73	12	The authors should consider softening the tone of this sentence as some forest	CP9: agree

1233						stakeholders do explicitly consider the potential consequences of climate change, as part of their forest management practices. (Government of Australia)	On & of to be covered
TS-1234	A	73	12	73	12	It is suggested to add: in most countries. Remark: Since 2005 there is some guidance for forest owners available in Denmark that informs how to address climate change in forest management in Denmark (For details: See ECCP II of the EU). (Government of Austria)	
TS-1235	A	73	15	73	17	check numbers; 13 cannot be correct where it is stated that reduction of forest area is taking place at a decreasing rate! (0 0, IPCC TSU WGIII)	Show annual change, per ha, global total
TS-1236	A	73	15	73	17	The units for "hectare per year" should be made uniform in lines 15 and 17. (Government of Pakistan)	
TS-1237	A	73	17	73	17	specify/correct unit "ha a-1" (Government of Czech Republic)	
TS-1238	A	73	21	73	24	TS.30 Include figure legend (Government of Spain)	
TS-1239	A	73	21	73	24	TS.30 Check whether the content of the figure is correct (Europe the largest forest area?) (Government of Spain)	
TS-1240	A	73	24	0	0	caption figure TS31 missing (Ronald Hutjes, Alterra)	
TS-1241	A	73	24	0	0	FigTS30: add world total (0 0, IPCC TSU WGIII)	
TS-1242	A	73	25	73	25	The authors should attempt to explain more clearly what they mean by the statement "Production of wood and non-wood forest products is the primary function for 34% of world forests". (Government of Australia)	
TS-1243	A	73	31	0	0	Section 9.2: I note that the TS does not contain a clear statement about the ability to "factor out" direct human induced from natural sequestration in planted and managed forests - but the SPM does. To the extent that this statement is justified, it would be important for the TS to include a statement about this, consistent with the statement made in the current SPM draft. Also note please that the WG1 TS also includes a statement that this factoring out is current not possible (see WG1 TS section 2.1.2), which you may want to refer to. (Andy Reisinger, TSU IPCC Synthesis Report)	New spm will address
TS-1244	A	73	33	73	38	Forests planted in very high carbon content soils may actually release more carbon through their life span than sequester - due to ploughing, draining, fertilisation, harvesting - all of which destroy the peat soils and thereby release CO2. A qualification should be added here.	Too detailed, to be addressed in the chapter Soften the sentence

						(James Curran, Scottish Environmental Protection Agency)	
TS-1245	A	74	0	74	0	Fig. TS 31 : Colors should be changed; yellow is hardly visible, some others are hardly distinguishable (Government of France)	
TS-1246	A	74	5	74	20	Recommend including global net emissions from LULUCF, 'land use change' and estimate of global 'sink' (Government of Australia)	
TS-1247	A	74	6	0	0	What is causing this great variation? (0 0, IPCC TSU WGIII)	
TS-1248	A	74	8	74	11	Please note that according to the WG1 assessment (see Table 7.3.2 in chapter 7) and unless I misread their report, land-use change in the tropics is somewhere between 0.5 and 2.8 GtC per year, not 4 GtC per year. It is very difficult if two different IPCC reports present different absolute figures with no explanation about the reason for the difference. Please attempt to reconcile or at least explain the differences in those two assessments. (Andy Reisinger, TSU IPCC Synthesis Report)	Check numbers and consistency with wg1, Peter to contact wg 1 author
TS-1249	A	74	8	74	11	the sum of emissions from conversion of forests (71%) and loss of soil carbon after deforestation (20%), emissions from forest degradation (4.4%), emissions from the 1997-1998 Indonesian exceptional fires (8.3%), and sinks from regrowth (-3.3%), is 100.4%, over 100%. Although there are uncertainties in each component, it is recommended to take the decimal away so that the sum is 100%. (Government of China Meteorological Administration)	
TS-1250	A	74	18	74	19	Fig. TS.31: LULUCF in China has been a net sink since 1980s. However this figure reported a net source before around year 2000, which is not right and is not consistent with scientific reports published. (Government of China Meteorological Administration)	Comment is right, references to be checked, X.Z. to provide papers
TS-1251	A	74	18	74	18	typo: change "annaul" to "annual"; tr afr, tr am and tr asia may not be understood, the colors for europe and tr asia cannot be distinguished (Government of The Netherlands)	
TS-1252	A	74	19	0	0	FigTS31: more contrast between colours necessary (0 0, IPCC TSU WGIII)	
TS-1253	A	74	20	0	0	missing reference in caption of fig TS31; is a sink pos or neg on the vertical axis (Ronald Hutjes, Alterra)	TS has no references, provided in chapter
TS-1254	A	74	30	78	20	Section 9.3: for the long term effect, biophysical feedbacks, in particular the albedo change resulting from deforestation or reforestation may play a major role on the climate, beyond the carbon budget: see WG1, chapter 7, § 7.1.1.1., page 5, line 33 to 54. The key issue is the time delay for those effects which occur year after year, to overcome the GHG atmospheric content change occuring once only. (Government of France)	Last sentence not addressed enough, to be addressed in the chapter 9.3 in limited length (Olga); in which circumstances important

TS-1255	A	75	1	75	5	The figure is not clear or helpful. For example, are the green arrows into and out of the atmospheric CO2 pool, or something else? Does arrow width have meaning? If not, why are there different widths? What do the red arrows mean? Do the red arrows reflect flow of carbon between “other land use” and “forests ecosystems” or do they reflect change in land area or something else (is it supposed to be “forest ecosystems”)? The figure is not helpful in supporting a statement that net emissions depend on the balance of many things. U.S. Government (Government of U.S. Department of State)	Werner to address arrows/colours, reject last part, also to be addressed in the main chapter
TS-1256	A	75	3	0	0	FigTS32: incorporate current figure title into text of section and use as a title: Complexity of mitigation in the forest sector (0 0, IPCC TSU WGIII)	
TS-75	B	75	5	0	0	The figure is not clear or helpful. For example, are the green arrows into and out of the atmospheric CO2 pool, or something else? Does arrow width have meaning? If not, why are there different widths? What do the red arrows mean? Do the red arrows reflect flow of carbon between “other land use” and “forests ecosystems” or do they reflect change in land area or something else (is it supposed to be “forest ecosystems”)? The figure is not helpful in supporting a statement that net emissions depend on the balance of many things. U.S. Government (Government of U.S. Department of State)	See TS-1255
TS-1257	A	75	20	75	24	Measures in category 2 can also increase landscape-level carbon density. On the other hand, measures in category 3 can also increase stand-level carbon density. Therefore, it is not necessay to separate them into two categories. In addition, avoiding forest degradation and devegetation, agroforestry, urban forestry, etc. are also important measures for enhancing carbon stock which should be included. It may be more appropriate to combine the category 2 and 3 into one category, namely like "maintaining or increasing carbon density".In this case, avoiding forest degradation and devegetation and other forestry measures can also be included as one of measures. (Government of China Meteorological Administration)	To be discussed in main chapter
TS-1258	A	75	24	75	24	Stating that "protection against fire" can be treated as a mitigation option, fails to account for regional circumstances in which fire management is more important than fire prevention. Table TS21 also explicitly notes that while prevention of fires have short term benefits it can increase fuel stock for later fires. The authors need to address this discrepancy. (Government of Australia)	Add/change to fire management
TS-1259	A	76	3	0	0	FigTS33: caption: insert 'mitigation' before options (0 0, IPCC TSU WGIII)	
TS-1260	A	76	4	76	4	typo: add "y" after "immediatel" (Government of The Netherlands)	
TS-1261	A	76	4	76	4	"immediatel" may be replaced by "immediately". (Government of Pakistan)	

TS-1262	A	76	8	76	9	Replace the phrase "and via intermediate biofuels" by "or via intermediate biofuels". (Government of Pakistan)	
TS-1263	A	76	9	0	0	it is not immediately clear what "its"refers to, rephrase sentence to "Much of the global population depends on non-industrial versions of wood for domestic heating and cooking." (Ronald Hutjes, Alterra)	
TS-1264	A	76	28	76	28	add after "increased" "/kept" as avoided deforestation is as the term says it explicity keeping stocks not enhancing them (Government of German Federal Environment Ministry)	
TS-1265	A	77	13	77	13	It is suggested to delete reference to "leakage" as leakage is a non-issue on a global scale. (Government of Austria)	
TS-1266	A	77	16	77	20	Table TS16, 2nd column. Check that complete names are not always visable. In Columns 4, 5, 6 and 7 use metric system notation, replacing ton by tonne. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	
TS-1267	A	77	17	0	0	TableTS16: add total (= 3146) (0 0, IPCC TSU WGIII)	
TS-1268	A	77	17	0	0	table TS 16 South America seems not to be mentioned, but the size of the figure (903) indicates that it is (Government of Norwegian Pollution Control Authority)	
TS-1269	A	78	1	78	5	Figure TS37 - It is unclear the comment on "however, literature does not allow such a dynamic approach". Please, clarify. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	
TS-1270	A	78	1	78	8	Figure TS 34: The authors should make it clear that the Figure projects that from 2012-2022 the baseline for the LULUCF sector could move from a sink to a source. The authors should highlight this in their explanation of the figure. (Government of Australia)	
TS-1271	A	78	3	0	0	figure TS34 deserves a bit more descriptive explanation of what is shown there: why is there a global source around 2020 in the LULUCF baseline? Why is there such a strong, alomost exponential recovery after that? Such explanations can also not be found in chapter 9, p48-50 (Ronald Hutjes, Alterra)	Agree that figure can be deleted from TS and chapter Although figure showing increasing potential, to be stated in the text
TS-1272	A	78	3	0	0	FigTS34, caption: indicate that large uncertainty in the figure. I prefer to delete this figure (little added value) (0 0, IPCC TSU WGIII)	
TS-	A	78	10	0	0	figure TS35 deserves to be included in the SPM ! In fact similar figures for the	accept

1273						other sectors with a brief explnanation of the cause of any significant changes in assessment between TAR and 4AR would be most welcome….. (Ronald Hutjes, Alterra)	
TS-1274	A	78	10	0	0	FigTS35: biological potential: same as technical potential? First bar applies to 2010 and the others to 2030. (0 0, IPCC TSU WGIII)	
TS-1275	A	78	10	78	10	figure TS.35: It is suggested to identify the year for which the mitigation potential has been calculated. Figure TS.34 indicates that the mitigation potential is a function of the year. (Government of Austria)	
TS-1276	A	78	17	78	17	It is suggested to delete this last sentence on leakage because from aglobal perspective (and assuming a global coherent effort) leakage is a non-issue. (Government of Austria)	
TS-1277	A	79	2	79	2	It is suggested to address in the Synthesis Report to the AR4 also the limits of adaptation to climate change of forest ecosystems in this context. (Government of Austria)	accept
TS-1278	A	79	29	79	36	there should one para dealing with all options provided by the KP that is Art. 3.3 and 3.4 activities, JI and CDM projects. Information in the current para is too detailed. As the beginn of the CP is in 2008 there is no statement possible about effectivness, this is another reason to limit the para to mention all KP options very shortly and generally. (Government of German Federal Environment Ministry)	
TS-1279	A	79	33	79	33	The authors should more clearly explain what they mean by "Projects in Annex I countries". Are they referring to Joint Implementation, or individual country based projects? (Government of Australia)	
TS-1280	A	79	34	79	36	"…Furthermore, the credits generated do not expire, because host country governments will remain responsible for the maintenance of the carbon stocks once built up on their territories…".The description is not exact. For example, tCER from A/R CDM will expire at the end of the commitment period followed the commitment period for which the tCER is issued. lCER will expire at the end of the crediting period. There are no rules saying that the government has responsibility to maintain the carbon stock built on the AR lands. For CDM AR land, it is responsibility of project implementing entities to maintain the carbon stock within the crediting period, rather than the host government. (Government of China Meteorological Administration)	
TS-1281	A	80	7	80	11	leave out (0 0, IPCC TSU WGIII)	
TS-1282	A	80	7	80	39	To shorten the TS the authors should consider whether the discussion of the impacts of non-climate policies can be either abbreviated or deleted.	To be considered

						(Government of Australia)	
TS-1283	A	80	41	80	47	Avoidance of carbon emissions from improved fire management in forests, and, specifically, avoiding uncharacteristically severe fires, could be substantial, but more research is needed. U.S. Government (Government of U.S. Department of State)	
TS-76	B	80	41	80	47	Reflect statements on lines 23-26 of page 73 of chapter 9 regarding the importance of understanding fire/pest/disease in the TS. U.S. Government (Government of U.S. Department of State)	
TS-1284	A	81	0	86	0	The Section on Waste emphasises the role of landfill gas recovery over the other options. Especially, it is the only technology described detail in Section 10.3, even though the table TS.18 suggests that waste incineration will be more important in the cost classes >10 $/t CO2. Add more information on waste incineration and shorten the text on landfill gas recovery to make the Section balanced. (Government of Finland)	Accept. More information on waste incineration and other potential technologies will be added.
TS-1285	A	81	3	0	0	Section 10.1: projections/scenarios (waste, wastewater) are missing (0 0, IPCC TSU WGIII)	Taken into account. Limited data are available in this sector. A range will be given based on 2 studies.
TS-1286	A	81	10	0	0	delete 'in the highly developed countries' (duplication) (0 0, IPCC TSU WGIII)	Accepted.
TS-1287	A	81	10	81	10	comment: "may be peaking" may give, although it is correctly formulated, nontheless an unfavorable impression, that is why we suggest to use "may begin to decline" in stead (Government of The Netherlands)	Rejected. Peaking does not necessarily mean decline in the future – e.g. we may reach a plateau or we may decline – but we don't know this.
TS-1288	A	81	11	81	13	we suggest to add "reduced use of virgin materials" as an additional co-benefit of waste management (Government of The Netherlands)	Accepted. We will add this phrase in Section 10.5 Para 1.
TS-1289	A	81	23	81	23	The following wording is suggested: .. requiring disposal-recycling. This could be expanded …. (Government of Austria)	Noted. This was an editorial typographic error. Replace with "…requiring disposal. Recycling…"
TS-1290	A	81	23	81	23	Change "disposal-recycling" to "disposal or other treatment and these initiatives" (Government of Finland)	Noted. See above.
TS-1291	A	81	35	81	40	This para (modified with focus on the emission estimates) would fit better in the next section. (Government of Finland)	Reject. The text applies to the current section.
TS-1292	A	81	44	81	49	The waste management sector is also a source of F-gas emissions through the disposal of F-gas containing waste. This topic needs to be discussed, and these emissions added to the sector total. F-gas mitigation potential and cost should also be assessed. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Noted. However, no data are available to our knowledge. Industry sector should discuss emissions of F gases.
TS-	A	81	44	0	0	contribution to emissions: for which year?	Noted. See discussion in Chapter 10. JB to

1293						(0 0, IPCC TSU WGIII)	add discussion in Chapter 10.
TS-1294	A	81	44	81	49	The waste management sector is also a source of F-gas emissions through the disposal of F-gas containing waste. This topic needs to be discussed, and these emissions added to the sector total. F-gas mitigation potential and cost should also be assessed. U.S. Government (Government of U.S. Department of State)	Noted. However, no data are available to our knowledge. (repeat of TS – 1292)
TS-1295	A	81	46	81	47	change 400, 80 and 40 into 450, 90 and 50 (see Table TS17) (0 0, IPCC TSU WGIII)	Taken into account. Align text to tables (with rounding).
TS-1296	A	81	46	81	47	when is "current"; numbers don't quite match those in table TS.17 (Government of UK)	Taken into account. Align text to tables (with rounding).
TS-1297	A	82	1	0	0	TableTS17: incorporate total of 1300 Mt also into TableTS2 (Page 3) (0 0, IPCC TSU WGIII)	Accepted – waste numbers will be added
TS-1298	A	82	1	82	5	Table TS17 - this table should be consitent with the estimates on the mitigation potential presented in Table TS18. (Government of Finland)	Taken into account. Authors will attempt to harmonise the data.
TS-1299	A	82	1	82	6	Table TS.17: The projected growth in GHG emissions from waste between 2020-2050 look very large compared to earlier periods. This needs explanation. Are projections past 2020 actually coming from UNFCCC National Inventories data or some other source? (Government of Australia)	Accepted. Table will be revised to be consistent with Table 10.3 including references. Figures in Table 10.3 will be rounded. Explanation will be added in the text and harmonize between TS and Chapter 10.
TS-1300	A	82	10	0	0	explain LAC (0 0, IPCC TSU WGIII)	Accepted. See below.
TS-1301	A	82	10	82	10	replace "the LAC region" by "Latin America" (Government of The Netherlands)	Accepted. We will replace "the LAC region" by "Latin America".
TS-1302	A	82	15	82	15	we understand that CH4-emissions from landfills have stabilized in developed countries (TS82, L39) and if so we suggest to change "mainly" to "all" (Government of The Netherlands)	Rejected. Emissions in some developed countries are still growing.
TS-1303	A	82	37	0	0	fully commercial: depends on lot of other factors (see Page 81, Lines 19-22). Do you mean techn. operational? (0 0, IPCC TSU WGIII)	Taken into account. Fully will be removed.
TS-1304	A	83	4	0	0	reducton potential higher than total emission? (0 0, IPCC TSU WGIII)	Accept. We will harmonize data between TS and Chapter 10.
TS-1305	A	83	4	0	0	missing in this section: waste water options/potentials (aerobic/anaerobic purification) (0 0, IPCC TSU WGIII)	Noted. However, no literature exists to our knowledge.
TS-1306	A	83	4	83	4	Change 2.3 Gt to nearly 1,0 Gt (the numbers in the table are cumulative) (Government of Finland)	Accepted.
TS-1307	A	83	9	0	0	why at a higher cost? (0 0, IPCC TSU WGIII)	Accepted. Replaced with “at a higher unit cost”.
TS-	A	83	9	83	9	Add the words "and carbon" after the word "energy". Both increasing energy and	Rejected. This is too simplistic a statement.

1308						carbon prices favor energy recovery. (Government of Finland)	
TS-1309	A	83	10	83	10	Change the last sentence to read: Because landfills continue to produce CH4 for many decades, landfill gas recovery and other mitigation measures (thermal process, biological treatment, etc.) will be complementary on shorter-term. (Government of Finland)	Accepted.
TS-1310	A	83	10	83	11	"Because landfills continue to produce CH4 for many decades, thermal processes can provide a complementary shorter-term mitigation measure." Please reconsider. Thermal processes can be seen as a LONG-term mitigation measure, as they prevent emissions from landfills for the entire time period when they would occur. Or rewrite as "Because landfills continue to produce CH4 for many decades, thermal processes can provide a complementary measure in the shorter-term, and lead to larger emission reductions in the long term. " (Government of Finland)	Taken into account. See previous decision.
TS-1311	A	83	13	83	13	Table TS.18, row 6: It is suggested to include the full wording Landfill gas recovery - energy and in addition the abbreviation LFG. (Government of Austria)	Accepted. No need to abbreviate.
TS-1312	A	83	14	83	14	table TS.18, please explain LFG, or add it to the abbreviation list (Government of The Netherlands)	Accepted. See above. No need to abbreviate.
TS-1313	A	84	10	84	30	Since the CDM is developing very fast at the moment it is important to you the most recent information. The information on the number of CDM project for all types including landfill gas projects can be updated using table 1 and table 2 in the "Analysis 2" sheet in the "UNEP Risoe CDM/JI Pipeline" published monthly on the www.cd4cdm.org web site at the address: www.cd4cdm.org/Publications/CDMpipeline.xls. This pipeline gives the most comprehensive overview of the develpment of the CDM and JI flexible mechanisms, and is the mostly used reference in this field. The latest update was published 14 September 2006. (Jørgen Fenhann, Risø)	Noted. Latest Landfill Gas % CDM from UNFCCC website will be used – as this gives current updated information. We will use Oct 2006 information as “current”.
TS-1314	A	84	12	84	15	delete however…fires: CDM is dealt with in Line 17 and the rest is too technical (0 0, IPCC TSU WGIII)	Noted. Paragraph will be revised based on Chapter 10 text.
TS-1315	A	84	19	0	0	insert 'and utilization' after recovery, (so, benefits are threefold…) (0 0, IPCC TSU WGIII)	Taken into account. Additional sentence will be added “Landfill gas utilization can bring an additional benefit”.
TS-1316	A	84	20	84	28	Also the total amount of CERs from all registered CDM projects could be mentioned in the text for general information to the reader. (Government of Finland)	Noted. See response to TS-1313.
TS-1317	A	84	22	84	22	replace "the LAC region" by "Latin America" (Government of The Netherlands)	Accepted.
TS-	A	84	26	84	27	This doesn't make sense; doing nothing is the cheapest solution!	Accepted. We will replace the phrase with

1318						(0 0, IPCC TSU WGIII)	"…lowers capital costs for project implementation when compared with a landfill gas utilisation project".
TS-1319	A	84	30	84	30	It is suggested to nsubstitute "Annual" by "annual". (Government of Austria)	Accepted.
TS-1320	A	84	31	84	31	Delete "Kyoto EB" replace with CDM Executive Board". (Government of Australia)	Accepted.
TS-1321	A	84	0	0	0	FigTS36: this figure is not really neccesary (0 0, IPCC TSU WGIII)	Rejected. Chapter 10 authors collectively agree CDM is important to the waste sector and the figure should remain.
TS-1322	A	85	13	0	0	electricity instead of electrical (0 0, IPCC TSU WGIII)	Accepted.
TS-1323	A	85	18	85	18	Delete "In developed countries not signatory to the Kyoto Protocol", replace with "In the USA and Australia". (Government of Australia)	Accepted.
TS-1324	A	85	30	0	0	economic measures are also policy instruments (0 0, IPCC TSU WGIII)	Reject. We do not say they are not policy instruments.
TS-1325	A	85	39	85	43	insert between Lines 27 and 29 (0 0, IPCC TSU WGIII)	Reject. The flow of policies is from general to specific.
TS-1326	A	85	49	0	0	has to be' instead of 'is' (0 0, IPCC TSU WGIII)	Accepted.
TS-1327	A	86	34	86	35	delete Recovery…emissions (duplication) (0 0, IPCC TSU WGIII)	Accepted.
TS-1328	A	86	36	0	0	Section 11: I am missing a statement about geo-engineering options in the TS. The SPM contains a clear statement about this, but I couldn't find it in the TS in section 11. The TS should contain all necessary material to underpin the SPM. (Andy Reisinger, TSU IPCC Synthesis Report)	
TS-1329	A	86	41	86	42	not clear what "or maybe another sector" refers to. Suggest "While many of the technological options mentioned in Chapters 4-10 concern specific sectors, some technologies reach across many sectors." (Government of UK)	
TS-1330	A	86	41	86	42	we suggest to replace "another" at the beginning of Line 42 with "one other" (Government of Norwegian Pollution Control Authority)	
TS-1331	A	86	42	86	43	change into: The switch from high carbon fuels to gas affects …..buildings. The use of biomass affects energy supply, agriculture & forestry, transport. (0 0, IPCC TSU WGIII)	
TS-1531	A	86	42	86	42	The following wording is suggested: E.g., the use of biomass … (Government of Austria)	
TS-1332	A	86	0	0	0	Section 10.5: missing: joining in with MD goals and with water, sanitation and health programmes of WHO	Chapter 5

						(0 0, IPCC TSU WGIII)	
TS-1333	A	87	8	87	15	Assumptions and uncertainties must be stated in compliance with TS page 15, line 16. (Nick Campbell, ARKEMA SA)	ACC.
TS-1334	A	87	8	87	15	It might help the reader to have these absoloute amounts of CO2eq expressed as percentages of total current emissions (it gives a better feel for what contribution might be made). The amounts quoted here fall between about 25% of current emissions and 60% - that immediately means more to me than the absolute tonnages. (James Curran, Scottish Environmental Protection Agency)	ACC.
TS-1335	A	87	8	87	15	The authors should include information as to whether these figures are in total or per annum, to assist the broader readership of the TS. (Government of Australia)	ACC.
TS-1336	A	87	8	87	8	Term 'total potential' cannot be interpreted in context of potentials taxonomy provided at TS p16 (lines 20 to 38). (Government of Australia)	UNCLEAR
TS-1337	A	87	19	87	19	Typo error. "...in mind that the top-down models discussed in Chapter 3..." (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	ACC.
TS-1338	A	87	19	87	19	It is suggested to delete "in" before "discussed". (Government of Austria)	ACC.
TS-1339	A	87	19	87	19	"in" appearing before "discussed" may be deleted. (Government of Pakistan)	ACC.
TS-1340	A	87	23	87	23	The chapters 8 specially, but also 9 and 10 show the crucial role of these sectors for the supply of biomass necessary for a significant part of the mitigation of GHGs in the other sectors. We suggest to add the following sentence. "In addition will the agriculture sector play a key role for the supply of bioenergy from organic waste, residues and dedicated energy crops for the mitigation of GHGs in other sectors". (Government of Norwegian Pollution Control Authority)	REJ. Information implied in sentence line 22-23.
TS-77	B	87	26	87	29	Suggest that there is a need to look specifically at literature on frontier technologies such as nano-technology and genetic modification of organisms. (Government of Australia)	To be discussed.
TS-78	B	87	26	87	29	Although there is a large body of literature on advanced technologies such as ocean storage and direct injection, this doesn't appear to be reflected in the discussion in the main body of the report. Thea authors should review the cited literature to ensure a proper balance of all new technologies is incorporated. (Government of Australia)	CH11 will and TS should reference the IPCC special report on CCS. Mainly covered in WGI and II, WGIII primarily focuses on the economics of such technologies.
TS-1341	A	87	29	87	32	suggest to rephrase "but ... oceans." to "but other impacts of high atmospheric CO2 concentrations, such as ocean acidification, would not be moderated."	REJ. Suggested sentences insufficiently clarifies that side effects are as yet unknown.

						(Government of The Netherlands)	
TS-1342	A	88	0	88	0	Table TS 19: some figures are missing in the last four columns, and therefore, the corresponding lines "All sectors" are meaningless (Government of France)	Noted. This problem is noted in the Table, and will be addressed.
TS-1343	A	88	0	0	0	table SPM.2, column 6-9, top row, add "for medium economic potential" (Government of The Netherlands)	REJ. “medium” is suggestive.
TS-1344	A	88	0	88	0	Table TS 19: second note, add text on the importance (small or significant?) of the other gases (Government of Finland)	Covered in table re-draft.
TS-1345	A	88	0	88	0	Table TS 19: add costs at regional level for the waste sector (Government of Finland)	Needs to be covered if data are avalable.
TS-1346	A	88	0	88	0	Table 19: estimate of the emissions in the Energy Supply sector as well as All sectors are missing. Without these data the table is incomplete as the mitigation potential doesn't mean much unless it is compared with projected emissions. (Government of Finland)	TIA
TS-79	B	88	0	88	0	Table TS 19 (which is also rightly given as Table SPM 2) would deserve a bit more explanation of the numberrs given in the TS background / assumptions uncertainties , ,,, (Government of European Community / European Commission)	TIA
TS-80	B	88	0	0	0	table SPM.2, comment: the figures given suggest to be accurate in Mtons, but the summing shows they have been rounded; it is therefore suggested to change in column 4-9, row 3, "Mton" to "Gton", and to express all figures in columns 4-9, rows 4-48 in this unit (Government of Netherlands/Ministry for the Environment)	TIA
TS-1347	A	88	1	0	0	see comment SPM, 10, 1 (Ronald Hutjes, Alterra)	UNCLEAR
TS-1348	A	88	1	0	0	The information in Table 10.6 (Chapter 10, Pg. 27) provides the regional breakdown and more comprehensive cost breakdown need to put the waste sector on the same basis as other sectors. This information should be incorporated into Table TS.19. The table should have a footnote describing the concerns that Chapter 10 authors have about the quality of their emissions data. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	TIA. Inclusion of footnote in TS to be discussed (sufficient if mentioned in Ch10).
TS-1349	A	88	1	88	5	Table TS19: I have been trying to compare this table with Table TS7 and TS8, and I think some text guiding the reader on which numbers to compare would be useful. It appears to be e.g. comparing the 5100 MtCO2eq for energy supply mitigation potential for <100$/ton by 2030 in TS.19 with 8736+3669 at $112/ton in Table TS.8 which seems quite different. It would be helpful to aid this comparison by writing the B2 reference emissions in each sector in 2030 in Table TS.19 to match Table TS8 and also to add the mitigation potential as % of the B2 ref scenario in 2030, which would make comparison with Table TS7 and 8 much easier.	TIA

						(Rachel Warren, University of East Anglia)	
TS-1350	A	88	1	88	5	Table TS19: would the numbers be different for other baseline scenarios than B2 e.g. A1 and do we know how much? How different is WEO from B2 (comment in footnote would be useful). Why are the costs unknown in only the transport sector? (Rachel Warren, University of East Anglia)	TIA
TS-1351	A	88	1	88	1	Table TS.19: It is a pity that the potential for combined heat and power is not included because its mitigation potentail might be significant. (Government of Austria)	REJ. Too much detail for table 19.
TS-1352	A	88	1	88	5	The information in Table 10.6 (Chapter 10, Pg. 27) provides the regional breakdown and more comprehensive cost breakdown needed to put the waste sector on the same basis as other sectors. This information should be incorporated into Table TS.19. The table should have a footnote describing the concerns that Chapter 10 authors have about the quality of their emissions data. U.S. Government (Government of U.S. Department of State)	See 1348.
TS-81	B	88	1	89	15	The expansive caveats that are included at Table 11.3 need to be used in the SPM and the TS. At present none of the information explaining why Table 11.3 needs to be treated with caution is included and, therefore, a more certain representation of cross-sectoral mitigation potentials is provided than is warranted. (Government of Australia)	ACC. Text on page 87, especially line 8, should be more elaborate on the TS19 table.
TS-82	B	88	1	89	15	The authors need to carefully review Table TS 19 to ensure that changes that are made in the body of the text after the current review period are reflected and flow through into this Table, as the Table could be a focus for policy makers. Before such a table is included the authors need to ensure that the "double-counting" issue is resolved. If this is not adequately addressed there is a distinct risk that this table will present an unrealistically optimistic picture of the mitigation challenge. The authors also need to carefully list exactly what is included in each of the sectors and explain how different metrics in the literature are accounted for. (Government of Australia)	ACC. See responses TS 81
TS-1353	A	88	52	88	0	The information in Table 10.6 (Chapter 10, Pg. 27) provides the regional breakdown and more comprehensive cost breakdown needed to put the waste sector on the same basis as other sectors. This information should be incorporated into Table TS.19. The table should have a footnote describing the concerns that Chapter 10 authors have about the quality of their emissions data. U.S. Government (Government of U.S. Department of State)	See 1348
TS-1354	A	89	10	89	11	It is unclear how the estimate of mitigation potential in Table 11.3 for the transport was developed. This text indicates that they are the potentials for light duty vehicles, biofuels and aviation only, but a sum for these factors is not shown in either Chapter 5 or 11. Chapter 11, Pg. 16, lines 36-42, referring to the transport sector, states "… some crude extrapolation is required for overall coverage.", but does not explain the basis or process for extrapolation. Finally, Table 5.17, is a summary of CO2 mitigation potential in the transport sector from several studies,	Refer to Ch 5

						but none estimate the 28.3% reduction indicated in this table. The table provides cost estimates for specific technologies, but not for the global total. There are costs estimates for an unspecified amount of mitigation in LDVs, which indicate that the cost will be below $100/tCO2 if oil price is somewhat above $40/Bbl. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	
TS-1355	A	89	10	89	11	It is unclear how the estimate of mitigation potential in Table 11.3 for transport was developed. This text indicates that they are the potentials for light duty vehicles, biofuels and aviation only, but a sum for these factors is not shown in either Chapter 5 or 11. Chapter 11, Pg. 16, lines 36-42, referring to the transport sector, states "… some crude extrapolation is required for overall coverage", but does not explain the basis or process for extrapolation. Finally, Table 5.17, is a summary of CO2 mitigation potential in the transport sector from several studies, but none estimate the 28.3% reduction indicated in this table. The table provides cost estimates for specific technologies, but not for the global total. There are costs estimates for an unspecified amount of mitigation in LDVs, which indicate that the cost will be below $100/tCO2 if oil price is somewhat above $40/Bbl. U.S. Government (Government of U.S. Department of State)	Refer to Ch 5
TS-1356	A	89	10	89	11	It is unclear how the estimate of mitigation potential in Table 11.3 for the transport was developed. This text indicates that they are the potentials for light duty vehicles, biofuels and aviation only, but a sum for these factors is not shown in either Chapter 5 or 11. Chapter 11, Pg. 16, lines 36-42, referring to the transport sector, states "… some crude extrapolation is required for overall coverage.", but does not explain the basis or process for extrapolation. Finally, Table 5.17, is a summary of CO2 mitigation potential in the transport sector from several studies, but none estimate the 28.3% reduction indicated in this table. The table provides cost estimates for specific technologies, but not for the global total. There are costs estimates for an unspecified amount of mitigation in LDVs, which indicate that the cost will be below $100/tCO2 if oil price is somewhat above $40/Bbl. U.S. Government (Government of U.S. Department of State)	Refer to ch 5
TS-1357	A	89	13	89	14	Delete the sentence "Industry is exclusive of material efficiency improvements, other than through recycling." Table 7.4 (Chapter 7, Pg. 11) lists a number of materials efficiency techniques other than recycling, e.g. the use of blended cements and geopolymers to reduce clinker requirement in the cement industry. The approach used by Chapter 7 estimated mitigation potential by industry, rather than by technology, makes estimating the amount of mitigation potential due to materials efficiency improvements difficult. However, they are included. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	ACC.
TS-1358	A	89	13	89	14	Delete the sentence "Industry is exclusive of material efficiency improvements, other than through recycling." Table 7.4 (Chapter 7, Pg. 11) lists a number of	ACC

						materials efficiency techniques other than recycling, e.g. the use of blended cements and geopolymers to reduce clinker requirement in the cement industry. The approach used by Chapter 7 estimated mitigation potential by industry, rather than by technology, makes estimating the amount of mitigation potential due to materials efficiency improvements difficult. However, they are included. U.S. Government (Government of U.S. Department of State)	
TS-1359	A	89	13	89	14	Delete the sentence "Industry is exclusive of material efficiency improvements, other than through recycling." Table 7.4 (Chapter 7, Pg. 11) lists a number of materials efficiency techniques other than recycling, e.g. the use of blended cements and geopolymers to reduce clinker requirement in the cement industry. The approach used by Chapter 7 estimated mitigation potential by industry, rather than by technology, makes estimating the amount of mitigation potential due to materials efficiency improvements difficult. However, they are included. U.S. Government (Government of U.S. Department of State)	ACC
TS-1360	A	89	18	89	19	insert between Lines 40 and 42 (0 0, IPCC TSU WGIII)	UNCLEAR
TS-1361	A	89	30	89	36	Add information on pathways below 3.5W/m2. It is desirable to have information on Category A scenarios represented in this paragraph. (This information is missing from the relevant part of chapter 11 as well) (Government of German Federal Environment Ministry)	TIA. Insufficient data to put on a par with the 3.5 and 4.5 W literature. Sentence to be inserted
TS-83	B	89	30	89	36	complicated phrasing, we suggest alternatively: "The development of the carbon price determines at which level the atmospheric GHG concentrations can be stabilized. Models suggest that a predictable and ongoing gradual increase in carbon price that would reach 20-25$/tCO2 probably much earlier than 2030 corresponds with 3.5W/m2 (multigas)/450ppm (CO2 only). For 4.5W/m2 (multigas)/550ppm (CO2 only) such a price level could be broken after 2030. (Government of Netherlands/Ministry for the Environment)	TIA. Will rephrase, also range needs changing to be consistent with chapter
TS-1362	A	89	38	89	38	Insert "energy-use related CO2" in front of emissions. This sentence appears to refer to the IEA's recently released study, Energy Technology Perspectives 2006. If so, the conclusion that IEA reached was that energy-use related CO2 emissions could be returned to a level 6% above 2003 in 2050. The comparison was made with 2003, because that was the last year for which the authors had data, but they indicated that the projected 2050 energy-use related CO2 emissions would be approximately equal to current (mid-2006) energy-use related CO2 emissions. However, the study was limited to this category of emissions, and did not address the roughly 1/3 of GHG emission that come from other sources. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	ACC
TS-1363	A	89	38	89	38	Insert "energy-use related CO2" in front of emissions. This sentence appears to refer to the IEA's recently released study, Energy Technology Perspectives 2006.	See TS-1362

						If so, the conclusion that IEA reached was that energy-use related CO2 emissions could be returned to a level 6% above 2003 in 2050. The comparison was made with 2003, because that was the last year for which the authors had data, but they indicated that the projected 2050 energy-use related CO2 emissions would be approximately equal to current (mid-2006) energy-use related CO2 emissions. However, the study was limited to this category of emissions, and did not address the roughly 1/3 of GHG emission that come from other sources. U.S. Government (Government of U.S. Department of State)	
TS-1364	A	89	38	89	38	Insert "energy-use related CO2" in front of emissions. This sentence appears to refer to the IEA's recently released study, Energy Technology Perspectives 2006. If so, the conclusion that IEA reached was that energy-use related CO2 emissions could be returned to a level 6% above 2003 in 2050. The comparison was made with 2003, because that was the last year for which the authors had data, but they indicated that the projected 2050 energy-use related CO2 emissions would be approximately equal to current (mid-2006) energy-use related CO2 emissions. However, the study was limited to this category of emissions, and did not address the roughly 1/3 of GHG emission that come from other sources. U.S. Government (Government of U.S. Department of State)	See TS-1362
TS-84	B	89	38	89	40	comment: it is essential to make explicit to what forcing and concentration this mid-range pathway would lead (Government of Netherlands/Ministry for the Environment)	ACC. Sentence inserted
TS-1365	A	89	50	90	4	This text presents a lower estimate of the economic impact of mitigation measures than was presented in either the SPM (Pg. 11, lines 19-23) or earlier in the Technical Summary, (Pg. 27, lines 1-5). Either the numbers need to be made consistent or the reason for the different numbers explained. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Clarified. These data are on CO2 only and TS table 5 indicates non-CO2 gases account for c.100ppm, so the numbers are not inconsistent. Will clarify in text.
TS-1366	A	89	50	90	4	This text presents a lower estimate of the economic impact of mitigation measures than was presented in either the SPM (Pg. 11, lines 19-23) or earlier in the Technical Summary, (Pg. 27, lines 1-5). Either the numbers need to be made consistent or the reason for the different numbers explained. U.S. Government (Government of U.S. Department of State)	See 1365
TS-1367	A	89	50	90	4	This text presents a lower estimate of the economic impact of mitigation measures than was presented in either the SPM (Pg. 11, lines 19-23) or earlier in the Technical Summary (Pg. 27, lines 1-5). Either the numbers need to be made consistent or the reason for the different numbers explained. U.S. Government (Government of U.S. Department of State)	See 1365
TS-1368	A	89	0	0	0	Section 11.1/Table TS19: assessment of options. Power and Industry is mentioned, but which policies, and what are the main barriers? (0 0, IPCC TSU WGIII)	[Section 11.1 to respond to this]
TS-85	B	90	14	90	14	typo: delete "that" (Government of Netherlands/Ministry for the Environment)	ACC

TS-1369	A	90	17	90	24	It is noted that most of the studies on this topic might not have considered the stronger than projected demand for fossil fuels in developing countries. Therefore those studies seem not to be very relevant for the current actual situation. (Government of Austria)	REJ. Comment appears to be misplaced. Cannot see its relevance to the lines indicated
TS-1370	A	90	18	90	18	It seems that the market failure is associated more with technological innovation-deficits and not with technological innovation-benefits. (Government of Austria)	ACC, clarify wording
TS-1371	A	90	34	90	36	This is a very important caveat to the model studies of induced technological change that needs to be retained in future drafts. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Noted
TS-1372	A	90	34	90	36	This is a very important caveat to the model studies of induced technological change that needs to be retained in future drafts. U.S. Government (Government of U.S. Department of State)	See TS-A-1371
TS-1373	A	90	39	90	41	"Comment. I suggest to modify the phrase: -Major technological shifts like carbon capture and storage, advanced nuclear and hydrogen require a long transition as learning by doing accumulates and markets expand.- In this way: -Major technological shifts like carbon capture and storage and advanced nuclear require a long transition as learning by doing accumulates and markets expand." (Mario Valentino Romeri, none - private Italian citizen)	REJ: Hydrogen is also a major technological shift contemplated in long-term climate change mitigation.
TS-1374	A	90	39	90	43	This is true for some renewables as well. Add "advanced renewables, " after "like" in line 39 (Government of German Federal Environment Ministry)	ACC. Include "advanced renewables" in list of examples p. 90 line 39.
TS-1375	A	91	3	91	24	When looking at the background information in chapter 11 the TS does not represent a fair summary of the carbon leakage issue. The attitude seems to be that carbon leakage is not significant. This is not true and by saying so the TS represents a biased version of results mentioned on p. 73 in chapter 11. There are surveys referenced in chapter 11 of a carbon leakage up to 40 percent in the EU. Reference could also be made to a study made by COWI for UNICE (Competitiveness and EU Climate Change Policy, octobre 2004), which estimates an impact of about 20 % carbon leakage already by 2010 in the EU (Study included in the email). (Helle Juhler-Kristoffersen, Confederation of Danish Industries)	See SPM770 – new text.
TS-1376	A	91	3	91	24	When looking at the background information in chapter 11 the TS does not represent a fair summary of the carbon leakage issue. The attitude seems to be that carbon leakage is not significant. This is not true and by saying so the TS represents a biased version of results mentioned on p. 73 in chapter 11. There are surveys referenced in chapter 11 of a carbon leakage up to 40 percent in the EU. Reference could also be made to a study made by COWI for UNICE (Competitiveness and EU Climate Change Policy, October 2004), which estimates an impact of about 20 % carbon leakage already by 2010 in the EU. (,)	See SPM770 – new text

TS-1377	A	91	3	91	24	When looking at the background information in chapter 11 the TS does not represent a fair summary of the carbon leakage issue. The attitude seems to be that carbon leakage is not significant. This is not true and by saying so the TS represents a biased version of results mentioned on p. 73 in chapter 11. There are surveys referenced in chapter 11 of a carbon leakage up to 40 percent in the EU. Reference could also be made to a study made by COWI for UNICE (Competitiveness and EU Climate Change Policy, October 2004), which estimates an impact of about 20 % carbon leakage already by 2010 in the EU. (Jean-Yves CANEILL, EDF)	See SPM770 – new text
TS-1378	A	91	7	91	9	Does not the actual off-shoring induced by cost labor contradict this rationale ? (Government of France)	Noted. Cost of labour may not be significant in some energy-intensive sectors.
TS-1379	A	91	26	91	0	In the Technical Summary (page 91) the description of co-benefits do cover the most important qualitative features of this issue, but it should be possible - and desirable - to include some more quantitative statements based on the information given in Chapter 11. (Government of Norwegian Pollution Control Authority)	REJ; better to avoid large numbers (See SPM-792)
TS-1380	A	91	30	91	31	The projection of the health effects of reduced air pollution is not as certain as implied by this sentence. Change the beginning of the sentence to "This is projected to result in the prevention …" to indicate that these are modeling results with all the uncertainty that such results imply. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	ACC; suggested text added
TS-1381	A	91	30	91	31	The projection of the health effects of reduced air pollution is not as certain as implied by this sentence. Change the beginning of the sentence to "This is projected to result in the prevention …" to indicate that these are modeling results with all the uncertainty that such results imply. U.S. Government (Government of U.S. Department of State)	See TS-1380
TS-1382	A	91	31	91	31	It is suggested to substitute "monetisation" by "monetarisation". (Government of Austria)	REJ; monetization is the accepted word for putting a monetary value on impacts
TS-1383	A	91	39	91	39	It is suggested to substitute "shows" by "show". (Government of Austria)	ACC;
TS-1384	A	91	46	91	46	Do the most recent diesel motors still emit more particulates than conventionnal motors ? (Government of France)	TIA; It is true than Euro standards are converging toward the same requirements for PM emissions for diesel and gasoline engines, but their adoption but the rest of the world is not immediately. The following sentence was added at the end: " …than their gasoline equivalents."
TS-	A	92	20	92	21	change 'From…sustainable' into 'This integration is…sustainable, including	Accept

1385						addressing the climate change problem' (0 0, IPCC TSU WGIII)	
TS-1386	A	92	23	0	0	delete 'however' (0 0, IPCC TSU WGIII)	Accept
TS-1387	A	92	27	0	0	insert 'and company' between sectoral and level (0 0, IPCC TSU WGIII)	Accept
TS-1388	A	92	28	0	0	insert between quantified and through: 'by development of various sets of indicators and' (0 0, IPCC TSU WGIII)	Accept
TS-1389	A	92	31	0	0	insert bewteen Line 31 and 33: Page 94, Lines 10-36 (0 0, IPCC TSU WGIII)	Accept
TS-1390	A	92	40	0	0	insert after 'development'. As already explained in Chapter 2,…' (0 0, IPCC TSU WGIII)	Accept
TS-1391	A	92	43	0	0	insert between Line 43 and 45: Page 93, Lines 19-21 (0 0, IPCC TSU WGIII)	Accept
TS-87	B	92	43	92	43	to enhance the understanding of this sentence we suggest to replace "levels of" by "will reduce" (Government of Netherlands/Ministry for the Environment)	Accept
TS-1392	A	92	45	92	49	leave out (duplication) (0 0, IPCC TSU WGIII)	Noted; this follows from paragraph above and is more specific
TS-1393	A	92	47	92	47	It is suggested to substitute "required" by "viable". (Government of Austria)	Accept
TS-1394	A	93	1	93	2	Delete: “ancillary benefits or”. The phrase “sometimes called ancillary benefits or co-benefits” implies that ancillary benefits and co-benefits are the same. They are not. As indicated in the definitions in the glossary, ancillary benefits are benefits that occur policies, even though the policy was not designed to provide those benefits. Co-benefits occur when policies are designed to achieve multiple objectives. It is unlikely that any government would design a climate mitigation policy without having multiple objectives, including sustainable development, in mind. This point is made explicitly on Pg. 104, lines 35-37 of this Technical Summary. While ancillary benefits have a theoretical meaning, it would be best if the term was dropped and emphasis was put on co-benefits. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accept; will delete clause
TS-1395	A	93	1	93	2	Delete: “ancillary benefits or”. The phrase “sometimes called ancillary benefits or co-benefits” implies that ancillary benefits and co-benefits are the same. They are not. As indicated in the definitions in the glossary, ancillary benefits are benefits that occur in conjunction with policies, even though the policy was not designed to provide those benefits. Co-benefits occur when policies are designed to achieve multiple objectives. It is unlikely that any government would design a climate mitigation policy without having multiple objectives, including sustainable	See TS-1394

						development, in mind. This point is made explicitly on Pg. 104, lines 35-37 of this Technical Summary. While ancillary benefits have a theoretical meaning, it would be best if the term were dropped and emphasis was put on co-benefits. U.S. Government (Government of U.S. Department of State)	
TS-88	B	93	2	93	2	Delete: "ancillary benefits or". The phrase "sometimes called ancillary benefits or co-benefits" implies that ancillary benefits and co-benefits are the same. They are not. As indicated in the definitions in the glossary, ancillary benefits are benefits that occur policies, even though the policy was not designed to provide those benefits. Co-benefits occur when policies are designed to achieve multiple objectives. It is unlikely that any government would design a climate mitigation policy without having multiple objectives, including sustainable development, in mind. This point is made explicitly on Pg. 104, lines 35-37 of this Technical Summary. While ancillary benefits have a theoretical meaning, it would be best if the term was dropped and emphasis was put on co-benefits. U.S. Government (Government of U.S. Department of State)	See TS-1394
TS-1396	A	93	3	93	3	It is suggested to substitute "jurisdiction" by "entity". (Government of Austria)	Accept; will change to 'organization'
TS-1397	A	93	4	93	6	leave out (0 0, IPCC TSU WGIII)	Accept
TS-89	B	93	12	93	14	suggest to replace "thereby ... efforts." to "thereby enhancing the result of both mitigation and adaptation efforts." (Government of Netherlands/Ministry for the Environment)	Accept; will re-word
TS-1398	A	93	19	93	21	This is an important statement that should be retained in future drafts. It is often asserted, including earlier in this Technical Summary (Pg. 8, lines 32-33), that climate change mitigation is automatically part of sustainable development, and sustainable development will automatically reduce GHG emissions. That is incorrect, and a firm statement to that effect is needed. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accept
TS-1399	A	93	19	93	21	The following wording is suggested: It is important to recognize that the relationship between sustainable development and climate change is not always mutually beneficial. In this context it seems important to highlight that sustainable development usually considers a shorter time horizon compared to mitigation of climate change that adds value only in a time horizon larger than several decades. (Government of Austria)	Reject; inferior suggestion to TS 1400
TS-1400	A	93	19	93	21	This is an important statement that should be retained in future drafts. It is often asserted, including earlier in this Technical Summary (Pg. 8, lines 32-33), that climate change mitigation is automatically part of sustainable development, and sustainable development will automatically reduce GHG emissions. That is incorrect, and a firm statement to that effect is needed. Suggest: 'development that is sustainable in many other respects may still result in GHG emissions.' This	accept

						allows for the fact that fuel switching, e.g. coal to natural gas, will still result in GHG emissions. However, with the possible exception of aerosol emissions (mentioned in the Ch. 12 text on p. 13, lines 7 – 10), I fail to find any examples of a sustainable development strategy that actually results in increased GHG emissions." U.S. Government (Government of U.S. Department of State)	
TS-90	B	93	19	93	21	This is an important statement that should be retained in future drafts. It is often asserted, including earlier in this Technical Summary (Pg. 8, lines 32-33), that climate change mitigation is automatically part of sustainable development, and sustainable development will automatically reduce GHG emissions. That is incorrect, and a firm statement to that effect is needed. U.S. Government (Government of U.S. Department of State)	See TS-1400
TS-91	B	93	21	93	21	add "Conversely, e.g. improving the access to energy could increase the need for mitigation." (Government of Netherlands/Ministry for the Environment)	Noted; will reword
TS-92	B	93	21	93	21	"I believe this overstates the case as written. Suggest: 'development that is sustainable in many other respects may still result in GHG emissions.' This allows for the fact that fuel switching, e.g. coal to natural gas, will still result in GHG emissions. However, with the possible exception of aerosol emissions (mentioned in the Ch. 12 text on p. 13, lines 7 – 10), report has no examples of a sustainable development strategy that actually results in increased GHG emissions." U.S. Government (Government of U.S. Department of State)	Accept
TS-93	B	93	28	97	5	Section 12.3 could be significantly abbreviated to simply include a short discussion of how climate change and development considerations can be mainstreamed, and how policy choices in non-climate sectors can influence emissions (i.e. Figure TS 37). (Government of Australia)	Accept
TS-1401	A	93	33	93	38	delete 'Developed…world' (0 0, IPCC TSU WGIII)	Accept
TS-1402	A	93	39	0	0	Add after policies: Priority mitigation areas for countries in this group may be in energy efficiency, renewable energy, CCS, etc. (0 0, IPCC TSU WGIII)	Reject; not relevant in the context of this section
TS-1403	A	93	42	93	42	It is suggested to identify (e.g. in a footnote) those countries that belong to the Commonwealth of Independent States. (Government of Austria)	Reject; we will use 'Economies in Transition' instead
TS-1404	A	94	6	94	6	It is suggested to insert "e.g." before "through CDM". This is to be more general and to avoid being policy presriptive. (Government of Austria)	Reject; we will drop CDM here, but will add a full paragraph on CDM in the TS
TS-	A	94	7	94	7	"Delete 'through CDM' at the end of the sentence, as this implies that CDM is the	Reject; we will drop CDM here, but will add a

1405						only means of development aid that can accomplish this objective." U.S. Government (Government of U.S. Department of State)	full paragraph on CDM in the TS
TS-94	B	94	7	94	7	"Delete 'through CDM' at the end of the sentence, as this implies that CDM is the only means of development aid that can accomplish this objective." U.S. Government (Government of U.S. Department of State)	See TS-1405
TS-1406	A	94	10	94	10	It is suggested to substitute "remains" by "remain". (Government of Austria)	Accept
TS-1407	A	94	13	94	14	The following wording is suggested: … but one involving also cicil society and the private sector. (Remark: "state" can be deleted because it is addressed already by "governments"). (Government of Austria)	Accept
TS-1408	A	94	23	94	23	Change "Industry" to "Business and industry." Industry implies process and manufacturing. With the growth of the service sector, a broader term is needed to include firms, such as large multinational retailers, who do not manufacture goods but can affect the emissions from the firms that do manufacture goods. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accept; will reword
TS-1409	A	94	23	94	23	Change "Industry" to "Business and industry." Industry implies process and manufacturing. With the growth of the service sector, a broader term is needed to include firms, such as large multinational retailers, who do not manufacture goods but can affect the emissions from the firms that do manufacture goods. U.S. Government (Government of U.S. Department of State)	See TS-1408
TS-95	B	94	23	94	23	Change "Industry" to "Business and industry." Industry implies process and manufacturing. With the growth of the service sector, a broader term is needed to include firms, such as large multinational retailers, who do not manufacture goods but can affect the emissions from the firms that do manufacture goods. U.S. Government (Government of U.S. Department of State)	See TS-1408
TS-1410	A	94	43	94	43	It is suggested to include "report to" before "have avoided". In addition reference to the underlying chapter of the full report should be included. (Government of Austria)	Reject; reporting has not happened
TS-1411	A	94	48	94	49	It would be interesting to learn more about the underlying assumptions of this assessment. It seems that the authors might have used an approach that did not consider the broader picture of development of developing countries. Such broader and long-term consideration might deliver different results. It is suggested either to further qualify the sentence by highlighting the specific scope of the underlying study or to delete this sentence. (Government of Austria)	accept

TS-1412	A	95	1	95	2	It is suggested to substitute "but" by "because". (Government of Austria)	Noted; will reword
TS-96	B	95	1	95	1	replace "but" by "though" and "but" by "still" (Government of Netherlands/Ministry for the Environment)	Noted; will reword
TS-1413	A	95	3	95	10	leave out (0 0, IPCC TSU WGIII)	Accept
TS-1414	A	95	14	95	16	"Reword for clarity: 'National circumstances, including not only endowments in primary energy resources, but also institutions, matter in determining how policies ultimately impact GHG emissions.'" U.S. Government (Government of U.S. Department of State)	Accept
TS-97	B	95	14	95	16	"Reword for clarity: 'National circumstances, including not only endowments in primary energy resources, but also institutions, matter in determining how policies ultimately impact GHG emissions.'" U.S. Government (Government of U.S. Department of State)	Accept
TS-1415	A	95	18	95	27	This assessment is very helpful. However, it would be appreciated to link it to the underlying main report of the Working Group. To facilitate, e.g. to get assess to the operational guidelines mentioned. (Government of Austria)	Reject; but will strengthen section
TS-1416	A	95	29	95	40	Delete this figure. It is too subject to misinterpretation. According to figure TS-1, CO2 emissions in 2002 were about 30 Gt. However, Figure TS.17 shows the total of all influences is over 60 Gt. While more than one policy can affect a single source of emissions, except for indicating that multilateral bank lending is an indirect influence, the figure does not indicate which influences are dominant. Also, for three of the seven bars on the chart, including fiscal policy, which is the largest bar, there is only a single estimate of influence. The notes indicate that for these three categories, all of the emissions in the category can be affected by policy, implying that the correct choice of policy could eliminate the emissions. This is clearly not the case in the period to 2030 that is the focus of the SPM. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	TIA; will discuss with TS team; an improved figure will be included in the chapter, and we reccomend that this be included in the TS
TS-1417	A	95	30	0	0	replace 'associated with'by 'that could be targeted for' (0 0, IPCC TSU WGIII)	TIA see TS 1416
TS-1418	A	95	32	95	33	The following wording is suggested: The size of the bar shows the opportunity for mainstreaming mitigation. (Government of Austria)	TIA see
TS-1419	A	95	33	0	0	insert 'quantitative' between significant and opportunity (0 0, IPCC TSU WGIII)	Reject; not necessary
TS-1420	A	95	35	0	0	see comment on Table TS.20. The argument that privatisation of electricity generation leads to lower levels of carbon dioxide release looks highly suspect to me. It appears to be based on the belief that the private sector will reduce transmission losses. This may or may not be true; is there objective data? But	TIA in revision of figure

						more importantly, privatisation usually means that governments have lost control of the energy mix for power generation, and this is likely to have a much bigger effect. A move to use gas for generation might improve releases; a move away from nuclear power might make them worse. There are various places in this document that recognise this, e.g. chapter 4, page 6, "Market competition alone will not lead to reduced carbon emissions."and "In developed countries lack of investment in plant and infrastructure from liberalization of the energy market…"; chapter 4, page 10 "Many barriers to implementing low-carbon technologies…still remain, including … uncertain rates of return on investment"; chapter 4, page 11, "Recent liberalization of energy markets in many countries has led to cheaper energy services in the short term, but in the longer-term investments with longer amortization periods and often lower returns are not being made due to short-term shareholder value maximization. … Addressing environmental impacts, including climate change, usually depends on regulatory laws and tax incentives rather than market mechanisms.") (Stanley Gordelier, Nuclear Energy Agency of the OECD)	
TS-1421	A	95	35	95	40	The text gives the wrong impression that that electricity deregulation or privatization always results in emission reduction of GHG gases. Furthermore it seems difficult to differentiate between fiscal policy and electricity supply because in many countries fiscal instruments determine to a significant amount the energy carrier used for electricity production. It is also unclear if rural energy supply in developing countries includes or excludes electricity supply. It is also noted that land-use management is not mentioned at all; however, decisions on land-use planning may have significant impact e.g. on transport emissions in the long term. Due to those ambiguities it is suggested to either improve the explanation or to delete this figure and the corresponding text. (Government of Austria)	TIA in figure revision
TS-1422	A	95	39	95	40	I suggest some care with the statement about the small impact of rural development policies in climate change. Large scale production of bioenergy is carried out in rural areas and can have a significant impact in GHG emissions (Moreira, 2006) "Moreira, J.R., 2006; Global Biomass Energy Potential, Journal of Mitigation and Adaptation Strategies for Global Change, 11, 313-333". This is one possible example, with much larger impact than the use of LPG cookstoves. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accept
TS-1423	A	96	0	96	0	Fig. TS 37: The graphical difference between direct and indirect influence is not clear (Government of France)	TIA when revising figure
TS-98	B	96	0	0	0	in figure TS.37 it is unclear what the reduction potential within the policy areas is, is it identical to the associated emissions? (Government of Netherlands/Ministry for the Environment)	TIA when revising figure

TS-1424	A	96	1	0	0	Figure TS.37. see comment on Table TS.20. The argument that privatisation of electricity generation leads to lower levels of carbon dioxide release looks highly suspect to me. It appears to be based on the belief that the private sector will reduce transmission losses. This may or may not be true; is there objective data? But more importantly, privatisation usually means that governments have lost control of the energy mix for power generation, and this is likely to have a much bigger effect. A move to use gas for generation might improve releases; a move away from nuclear power might make them worse. There are various places in this document that recognise this, e.g. chapter 4, page 6, "Market competition alone will not lead to reduced carbon emissions."and "In developed countries lack of investment in plant and infrastructure from liberalization of the energy market…"; chapter 4, page 10 "Many barriers to implementing low-carbon technologies…still remain, including … uncertain rates of return on investment"; chapter 4, page 11, "Recent liberalization of energy markets in many countries has led to cheaper energy services in the short term, but in the longer-term investments with longer amortization periods and often lower returns are not being made due to short-term shareholder value maximization. … Addressing environmental impacts, including climate change, usually depends on regulatory laws and tax incentives rather than market mechanisms.") (Stanley Gordelier, Nuclear Energy Agency of the OECD)	TIA when revising figure
TS-99	B	96	1	96	0	As currently presented, the figure is problematic. Authors should elaborate the detailed source of this information. It is too subject to misinterpretation. The explanation in this chapter is sufficiently detailed in pages 51-52 to explain the meaning of the figure, but even in the TS and SPM, that detail disappears (could add figure caption from SPM.6 to Figure 12.4 too). For example, the SPM refers to policy areas, not sectors, implying that the correct choice of policies could eliminate the emissions. Note: comments are needed for this figure in SPM.6 U.S. Government (Government of U.S. Department of State)	TIA when revising figure
TS-1425	A	97	1	0	0	Table TS.20. The argument that privatisation of electricity generation leads to lower levels of carbon dioxide release looks highly suspect to me. It appears to be based on the belief that the private sector will reduce transmission losses. This may or may not be true; is there objective data? But more importantly, privatisation usually means that governments have lost control of the energy mix for power generation, and this is likely to have a much bigger effect. A move to use gas for generation might improve releases; a move away from nuclear power might make them worse. There are various places in this document that recognise this, e.g. chapter 4, page 6, "Market competition alone will not lead to reduced carbon emissions."and "In developed countries lack of investment in plant and infrastructure from liberalization of the energy market…"; chapter 4, page 10 "Many barriers to implementing low-carbon technologies…still remain, including	TIA when revising figure

						… uncertain rates of return on investment"; chapter 4, page 11, "Recent liberalization of energy markets in many countries has led to cheaper energy services in the short term, but in the longer-term investments with longer amortization periods and often lower returns are not being made due to short-term shareholder value maximization. … Addressing environmental impacts, including climate change, usually depends on regulatory laws and tax incentives rather than market mechanisms." (Stanley Gordelier, Nuclear Energy Agency of the OECD)	
TS-1426	A	97	5	0	0	Section 12.4: refer to and discuss Table TS21 (0 0, IPCC TSU WGIII)	Accept
TS-1427	A	97	5	0	0	Section 12.4: discuss some cases + criteria (0 0, IPCC TSU WGIII)	Noted; will be taken into account
TS-1428	A	97	7	97	9	The words of "to allow regional choices to be made" are unclear. The description shoud be changed. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	TIA; change will be made to be consistent with SPM; 'rational' changed to 'informed'
TS-1429	A	97	9	97	9	What does "rational choice" mean? Rather I would suggest to rewrite as "where trade-offs are inevitable, careful attention should be made of the priority among them". (Mitsutsune Yamaguchi, Teikyo University)	TIA; change will be made to be consistent with SPM; 'rational' changed to 'informed'
TS-1430	A	97	19	97	20	Is the description of "Energy efficiency options are almost always cost effective" correct? The cost effectiveness of energy efficient technologies depends on the conditions of energy prices, which vary among regions, time points etc. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Noted; will consider and clarify
TS-1431	A	97	19	0	0	insert after options: reducing CO2 emisions (0 0, IPCC TSU WGIII)	Reject; implied already
TS-1432	A	97	0	0	0	Table TS.20: It is suggested to include the explanation for T&Din the second row, second column. (Government of Austria)	Accept
TS-1433	A	98	4	98	5	"Reducing deforestation….may result in loss of economic welfare": if that is already so, it is only temporarily so as deforestation leads mostly to the loss of sources of income in the longer term, soil degradation, etc. In its current formulation this is an outdated view dating back to the time of the elaboration of the Kyoto Protocol when the only option to reduce deforestation was by some perceived to be limited to the establishment of national parks and the eviction of indigenous people from those parks. Currently projects to reduce emissions from deforestation and/or forest degradation are undertaken mostly for and by local communities and lead to higher levels of welfare and empowerment of the communities. (Eveline Trines, Treeness Consult)	Noted; will reword on the basis of SPM comments

TS-1434	A	98	4	0	0	insert after have: ', besides reduction of CO2 emissions' (0 0, IPCC TSU WGIII)	Noted; will reword on the basis of SPM comments
TS-1435	A	98	4	98	5	"Policies that avoid deforestation have significant biodiversity, soil and water conservation benefits at the risk of loss of economic welfare." This statement does not seem to give credit to the significant economic benefits that can be obtained from biodiversity whose conservation can be greatly assisted by decreasing deforestation activities, including the following economic benefits: pharmaceutical opportunities, water purification, pest control, pollination, soil protection, recreation and ecotourism, etc. See reference "Environmental services of biodiversity" by Norman Myers, PNAS 93, 2764-2769, 1996. Also, conserving biological diversity and its sustainable use have a fundamental role in the daily lives of humans and is critical for human health. A source of reference is a book resulting from a 1995 conference sponsored by NIH, NSF, the Smithsonian Institution, NAPE, PAHO that discussed issues linking human health to biodiversity. Book: Biodiversity and Human Health. Grifo F and J Rosenthal (editors). 1997. Island Press, Washington, DC, ISBN 1-55963-501-0. U.S. Government (Government of U.S. Department of State)	Noted; will reword on the basis of SPM comments
TS-100	B	98	4	98	5	"Policies that avoid deforestation have significant biodiversity, soil and water conservation benefits at the risk of loss of economic welfare." This statement does not seem to give credit to the significant economic benefits that can be obtained from biodiversity whose conservation can be greatly assisted by decreasing deforestation activities, including the following economic benefits: pharmaceutical opportunities, water purification, pest control, pollination, soil protection, recreation and ecotourism, etc. See reference "Environmental services of biodiversity" by Norman Myers, PNAS 93, 2764-2769, 1996. Also, conserving biological diversity and its sustainable use have a fundamental role in the daily lives of humans and is critical for human health. A source of reference is a book resulting from a 1995 conference sponsored by NIH, NSF, the Smithsonian Institution, NAPE, PAHO that discussed issues linking human health to biodiversity. Book: Biodiversity and Human Health. Grifo F and J Rosenthal (editors). 1997. Island Press, Washington, DC, ISBN 1-55963-501-0. U.S. Government (Government of U.S. Department of State)	Noted; will reword on the basis of SPM comments
TS-1436	A	98	5	98	5	It is suggested to substitute "forestation" by "afforestation" (or reforestation). This would enhance clarity. (Government of Austria)	Accept
TS-1437	A	98	7	98	7	"….at the POSSIBLE risk of loss of agricultural land and biodiversity." (Eveline Trines, Treeness Consult)	Reject; 'risk' implies probability
TS-1438	A	98	11	0	0	insert after also: 'by various mitigation measures' (0 0, IPCC TSU WGIII)	Accept

TS-1439	A	98	14	98	14	It is suggested to substitute "forestation" by "afforestation" (or reforestation). This would enhance clarity. (Government of Austria)	Accept
TS-1440	A	99	0	99	0	Table TS.21: Transportation sector: it is noted that land-use management is not mentioned. However, it is a relevant option in the transport sector. The same is true for the mode of transport (transport by ship or rail is much more energy efficient compared to transport by car). (Government of Austria)	Noted; will make table consistent with sectoral chapters
TS-1441	A	99	0	99	0	Table TS.21: energy sector, second column: energy efficiency improvements are not always cost-effective. There are many examples that show that the use of the most cost-effective technologies is expensive (e.g. energy efficient lighting, energy-efficient cars (3l car, hybrid cars). Usually a strong driver (e.g. like the oil price shock in the 70ties) or government policies (green star programme) is needed in order to further improve energy efficiency. The assessment of the IEA shows that whereas there was significant improvement in energy efficiency in the 80ties this trend became much weaker in the 90ties due to low oil price. (Government of Austria)	Refer to TS 1430
TS-1442	A	99	0	99	0	Table TS.21: DAES: Reduced exports of fossil-fuel-exporting countries seem unlikely due to the strong increase in demand in many countries. It is suggested to either qualify that statement (e.g. assuming that there is no increase in demand in other countries) or to delete it. (Government of Austria)	Accept; will clarify
TS-1443	A	99	0	99	0	Table TS.21: The table is not mentioned in the text. Where does the table belong to? Why are only some sectors listed in the table? (Government of German Federal Environment Ministry)	Accept
TS-101	B	99	0	102	0	table TS.21, in row "recycling and reuse" in column "trade-offs" add ", but when properly executed it is the second best option ranking right after waste prevention" (Government of Netherlands/Ministry for the Environment)	Reject; this is a trade-off column, and should not includes reference to benefits
TS-102	B	99	0	102	0	table TS.21, in row "biomass combustion" column synergies add ", can provide energy", and in column "trade-offs" add "and other pollutants" (Government of Netherlands/Ministry for the Environment)	Accept
TS-103	B	99	0	102	0	table TS.21, in row "biological treatment" column synergies add ", can provide biogas", and in column "trade-offs" add "Is itself a source of CO2 and CH4 emissions" (Government of Netherlands/Ministry for the Environment)	Accept
TS-104	B	99	0	102	0	table TS.21, comment: it may be useful to add CCS to the energy section options, as its relationship with SD will be discussed intensively in the near future (Government of Netherlands/Ministry for the Environment)	Noted; will check IPCC Special report and revise accordingly
TS-105	B	99	0	102	0	table TS.21, comment: it is advised to add waste prevention to the waste section (Government of Netherlands/Ministry for the Environment)	Noted; will discuss with Waste Chapter

TS-1444	A	99	1	99	1	Change “Energy sector” to “Energy use”. The table describes options in the transportation, buildings, and industrial sectors. It makes little sense to separate these out to follow the Chapter 4-10 split, since it would lead to redundancy in the table. However, the Chapter 4-10 split requires care be taken when the term “energy sector” is used. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	See 1440
TS-1445	A	99	1	99	1	Change “Energy sector” to “Energy use”. The table describes options in the transportation, buildings, and industrial sectors. It makes little sense to separate these out to follow the Chapter 4-10 split, since it would lead to redundancy in the table. However, the Chapter 4-10 split requires care be taken when the term “energy sector” is used. U.S. Government (Government of U.S. Department of State)	See 1440
TS-106	B	99	1	102	30	The authors need to provide an explanation as to why the transport sector is excluded from Table TS 21. (Government of Australia)	See 1440
TS-107	B	99	1	99	1	Change “Energy sector” to “Energy use”. The table describes options in the transportation, buildings, and industrial sectors. It makes little sense to separate these out to follow the Chapter 4-10 split, since it would lead to redundancy in the table. However, the Chapter 4-10 split requires care be taken when the term “energy sector” is used. U.S. Government (Government of U.S. Department of State)	See 1440
TS-1446	A	100	0	100	0	Table TS.21: It is suggested to substitute "imported alternative energy sources (IAES)" by "imported more climate friendly alternative energy sources (IAES). (Government of Austria)	Accept
TS-1447	A	100	0	100	0	Table TS.21: It is suggested to substitute "Forestation" by "Afforestation" in order to add clarity. (Government of Austria)	Accept
TS-1448	A	100	0	101	0	Table TS.21: It is suggested to indicate regions (countries) where options with regaqrd to foresty and agriculture might be relevant. (Government of Austria)	Reject; too detailed
TS-1449	A	100	0	100	0	Table TS.21, row bio-energy production; third column: competition can be between land, labour, finance, .. (Government of Austria)	Accept
TS-1450	A	100	0	100	0	Table TS.21, row "Forestation": It is suggested to substitute "if" by "and" in the second column, so that the sentence reads as follows: Can retain soil carbon stocks and soil disturbance … (Government of Austria)	Accept
TS-108	B	100	0	100	0	TS.21: Sectoral Mitigation Options and Sustainable Development (Economic, Local Environmental and Social); Under “Forestation” section: Potential SD trade-offs: "Monoculture plantations can reduce biodiversity and increase risk of	TIA; Will consider improving the table

						severe economic loss." Here it does not mention that monoculture plantations can also increase chances of the spread of plant diseases, which could also be exacerbated by climate changes. There seems to be only a brief statement on this issue on Chapter 12, line 29, page 62, which reads: "A major concern is that forestation may diminish food security if it were to occur primarily on rich agricultural land, and that monoculture plantations would reduce biodiversity and increase the risk of catastrophic failure due to diseases." U.S. Government (Government of U.S. Department of State)	
TS-1451	A	100	10	100	0	Table TS.21: Sectoral Mitigation Options and Sustainable Development (Economic, Local Environmental and Social); Under "Forestation" section: Potential SD trade-offs: "Monoculture plantations can reduce biodiversity and increase risk of severe economic loss." Here it does not mention that monoculture plantations can also increase chances of the spread of plant diseases, which could also be exacerbated by climate changes. There seems to be only a brief statement on this issue on Chapter 12, line 29, page 62, which reads: "A major concern is that forestation may diminish food security if it were to occur primarily on rich agricultural land, and that monoculture plantations would reduce biodiversity and increase the risk of catastrophic failure due to diseases." U.S. Government (Government of U.S. Department of State)	TIA; will consider revising table
TS-1452	A	101	0	101	0	Table TS.21, livestock management, second column: It is suggested to either specify the region/country where such policy might be relevant, or to delete it because rice cultivation in arid regions seems to be strange. (Government of Austria)	Accept; will clarify
TS-1453	A	101	0	101	0	Table TS.21, cropland management, second column: Delete the last sentence ("Perverse policies …) or improve it. (Government of Austria)	Accept; will clarify
TS-1454	A	102	0	102	0	Landfills - places for recreation and …??? Please delete - misleading. (Government of Finland)	Reject; this is true in some cases
TS-1455	A	102	1	102	1	Table TS21, "Biomass combustion". It is useful to complement information on 3rd column as such. "When non sustainable biomass is used is a significant source of CO2 emissions. When sustainable biomass is used it contributes to CO2 mitigation". (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accept
TS-1456	A	103	13	103	14	The following wording is suggested: .., distributional considerations and institutional feasibility, by which ... (Government of Austria)	Accept
TS-109	B	103	13	103	45	The presentation of evaluation criteria in this section (i.e. four principle criteria) is inconsistent with the criteria for evaluating international agreement, the authors should explain the inconsistency in the evaluation criteria.	To be considered (see also TS-132 on Page 205)

						(Government of Australia)	
TS-1457	A	103	25	0	0	"emission taxes and charges …." remove "emission". Not only emission taxes could be part of a national policy but also other taxes - for example energy taxes, vehicle taxes - can be used to reduce GHG emissions in a mix of climate, energy and transport policies. (same comment concerns Chapter 13 page 6, line 22) (Government of Sweden)	Accept
TS-110	B	103	25	103	25	comment: tradable permits may lead to the misunderstanding that this is about the environmental permit, it is therefore suggested to replace "tradable permits" by "tradable emission rights" throughout the text, e.g. in lines 48 and 54 of this page (Government of Netherlands/Ministry for the Environment)	Reject
TS-111	B	103	25	103	25	comment: there may be a wrong understanding of subsidies in this regard, and we suggest to add "perverse" (Government of Netherlands/Ministry for the Environment)	Reject
TS-1458	A	103	27	103	27	The following wording is suggested: .., and social development goals also can affect GHG emissions. (delete "also"). (Government of Austria)	Reject
TS-1459	A	103	28	103	28	It is suggested to substitute "with" by "into". (Government of Austria)	TIA
TS-1460	A	103	36	103	40	Regulation is alos valuable when there is urgency to a situation (eg regulation was used to tackle the ozone hole) (James Curran, Scottish Environmental Protection Agency)	TIA
TS-112	B	103	36	103	40	This general conclusion about the inferiority of standards is not supported by the material on page 13-8, where literature with different conclusions is quoted. Standards are common practice in the building sector and there is strong innovation (e.g. low-E glazing). (Government of European Community / European Commission)	TIA
TS-1461	A	103	37	103	37	It is suggested to add after "depends on their stringency": "and enforcement". (Government of Austria)	TIA
TS-1462	A	103	37	103	37	Add "lack of" after "when". Otherwise unclear, why information as such could be a barrier. (Government of German Federal Environment Ministry)	TIA
TS-1463	A	103	38	0	40	"However, they are generally viewed as inferior to price-based instruments in inducing innovation and technology ……" This sentence should be modified. In the full text in chapter 13, page 8, line 20 it says that "the economics literature generally views regulatory standards as inferior …" . And line 29/30 elaborates "nevertheless, there are examples in the literature of technology innovation spurred by regulatory standards." These modifications should be reflected in the summaries. Proposal: change line 38-40 and in chapter 13, page 6, line 22 to "However, in the economics literature they are generally viewed as inferior to price-based instruments in inducing innovation and technology, but there are	TIA

						examples that technology innovation have been spurred by regulatory standards. (same comment concerns Chapter 13, page 3, line 6-7) (Government of Sweden)	
TS-1464	A	103	41	103	47	Suggest replacing first sentence by: "Taxes and charges (which can be applied to carbon or all greenhouse gases) are given high marks for economic efficiency. They cannot guarantee a particular short term level of emissions, but because of the large existing atmospheric stock of gases, what matters for environmental effectiveness is average emissions over several years, which taxes can control if they can be made sufficiently adjustable. Taxes will be politically difficult to implement unless thresholds are used to reduce the amount of revenue raised." (Jack Pezzey, Australian National University)	TIA
TS-113	B	103	41	103	47	The evaluation of the costs and benefits of the section on Taxes and charges does not fully reflect the discussion of Chapter 13. While it is recognised that space constraints mean that the authors cannot include all of the information, the balance of the TS is balanced more towards a negative view of taxes and charges than what is represented in Chapter 13, this balance needs to be addressed. Suggest replacing first sentence by: "Taxes and charges (which can be applied to carbon or all greenhouse gases) are given high marks for economic efficiency. They cannot guarantee a particular short term level of emissions, but because of the large existing atmospheric stock of gases, what matters for environmental effectiveness is average emissions over several years, which taxes can control if they can be made sufficiently adjustable. Taxes will be politically difficult to implement unless thresholds are used to reduce the amount of revenue raised." (Government of Australia)	Accept
TS-1465	A	103	45	103	45	"Uncertainty in the relationship between price and behaviour can make selecting the right level challenging": This statement seems to imply that it is easy to select the right level of emissions or abatement. But given uncertainties about future climate change damages and indeed societal preferences this is of course not so. Suggestion for rewording: "Uncertainty in the relationship between price and behaviour means that emissions levels cannot be accurately predetermined using taxes and charges". (Frank Jotzo, Australian National University)	TIA
TS-114	B	103	45	103	45	"Uncertainty in the relationship between price and behaviour can make selecting the right level challenging": This statement seems to imply that it is easy to select the right level of emissions or abatement. But given uncertainties about future climate change damages and indeed societal preferences this is of course not so. Suggestion for rewording: "Uncertainty in the relationship between price and behaviour means that emissions levels cannot be accurately predetermined using taxes and charges". (Government of Australia)	See TS-1465
TS-	A	103	48	104	6	Suggest adding at end: "[targets], and this in itself can cause political problems in	Reject

1466						implementation[.] (Jack Pezzey, Australian National University)	
TS-115	B	103	48	104	6	Suggest adding at end: "[targets], and this in itself can cause political problems in implementation[.] (Government of Australia)	See TS-1466
TS-1467	A	103	53	103	53	IF A permit system (Joe Asamoah, International Energy Foundation)	Unclear
TS-1468	A	104	5	104	6	Here it should be noted that various options have been proposed to reduce the degree of a priori cost uncertainty inherent in permit trading, principally making targets more flexible. (Refer to Ch.13, esp. p.53.) (Frank Jotzo, Australian National University)	Noted but reject for TS
TS-1469	A	104	5	104	6	Baselines are also hard to establish and may be disputed. (James Curran, Scottish Environmental Protection Agency)	Reject
TS-116	B	104	6	104	6	add "For larger point sources the overhead of emissions trading (emission registration, reporting and verification, and trading costs) can be relatively modest. Other sources (small and diffuse) can be linked however through upstream actors, such as car emissions through trading by the oil companies and transfer to the car owner by the fuelprice." (Government of Netherlands/Ministry for the Environment)	Reject
TS-1470	A	104	7	104	13	Voluntary agreements can be very useful as testbeds - in advance of introducing regulatory or other appropriate policies. (James Curran, Scottish Environmental Protection Agency)	Noted
TS-1471	A	104	7	104	11	Delete “but to date have generally yielded only modest results.” This is true of all climate policies, not merely VAs. The same can be said of the following sentence. There are few programs, voluntary or mandatory that are not modest in their objectives. Those that are not (e.g., Kyoto targets for several countries) are not being met. At a minimum, redraft to say: “On balance, many voluntary agreements have achieved modest results, though a number have had significant impacts.” U.S. Government (Government of U.S. Department of State)	TIA
TS-117	B	104	7	104	11	Delete “but to date have generally yielded only modest results.” This is true of all climate policies, not merely VAs. The same can be said of the following sentence. There are few programs, voluntary or mandatory that are not modest in their objectives. Those that are not (e.g., Kyoto targets for several countries) are not being met. At a minimum, redraft to say: “On balance, many voluntary agreements have achieved modest results, though a number have had significant impacts.” U.S. Government (Government of U.S. Department of State)	See TS-1471
TS-1472	A	104	9	104	11	The subjective comment starting with "on balance" is not reflected by the discussion in the full text and must be deleted. Furthermore, this paragraph clearly	Reject

						does not reflect that both voluntary agreements and voluntary actions have resulted in significant emissions reductions. The latter topic is discussed within the full text. (,)	
TS-118	B	104	10	104	11	replace "achieved ... beyond" by "speeded up the application of the best available technology" (Government of Netherlands/Ministry for the Environment)	TIA
TS-119	B	104	15	104	15	typo "programmes" (Government of Netherlands/Ministry for the Environment)	Accept
TS-120	B	104	17	104	17	after "technologies" add ", provided these incentives are available for a longer period and business can rely on them when making investment decisions" (Government of Netherlands/Ministry for the Environment)	TIA
TS-1473	A	104	21	104	27	It is very important to fund a full spectrum of research, from blue-sky to applied and operational, in a coordinated way - so that ideas and developments flow from one end to the other. (James Curran, Scottish Environmental Protection Agency)	Noted
TS-1474	A	104	24	104	27	Needlessly controversial sentence. Suggest remove or rewrite positively to encourage increased funding in all sectors. U.S. Government (Government of U.S. Department of State)	Reject
TS-121	B	104	24	104	27	Needlessly controversial sentence apparently as if renewables have not been sufficiently supported. Suggest remove or rewrite positively to encourage increased funding in all sectors. U.S. Government (Government of U.S. Department of State)	Reject
TS-1475	A	104	26	104	26	It is suggested to substitute "that governments are capable of providing" by "that governments are willing to provide". (Government of Austria)	TIA
TS-1476	A	104	39	105	6	This paragraph neglects an important point: Actions by U.S. States have a long history of influencing U.S. national environmental policy, which in turn has often provided a benchmark for other nations. A classic example is control of air pollutants emitted by motor vehicles. California has led the nation and the world in setting stringent emissions standards for motor vehicles. The U.S. Clean Air Act recognizes California's ability to set more stringent standards, and allows other U.S. states to set standards that mirror California's. The potential consequences of having several states with stringent motor vehicle emissions standards, effectively creating two separate motor vehicle markets within the U.S., was a significant factor in the U.S. government's promulgation of and the auto industry's acceptance of both the national low emission vehicle standards adopted in the 1990s and the more stringent U.S. federal "Tier 2" emissions standards, adopted in 2000. Many other examples are available in the U.S. context. U.S. Government (Government of U.S. Department of State)	See TS 122 Noted
TS-	A	104	39	105	6	Actions by sub-national governments have indeed led to nationally significant	TSU: Accept (Chap 13 – Noted)

1477						emissions reductions for criteria air pollutants (NOx, volatile organic compounds, etc.). There is no reason to believe that this approach would not also prove effective for GHG emissions abatement. Beyond the dynamic by which state standards can induce national action, state standards themselves can have a measurable impact. California's GHG emissions standards for motor vehicles have been adopted now by 10 other states, together comprising nearly 30% of the U.S. auto market. These standards would require a 30% reduction in new vehicle GHG emissions by 2016. If these standards survive a lawsuit recently filed by the auto manufacturers and dealers, they could ultimately force a significant reduction in the GHG emissions of new motor vehicles sold in the U.S. Ultimately, this would also be globally significant, given that U.S. light duty vehicles are responsible for about 4 to 5% of global carbon emissions (DeCicco and Fung, Global Warming on the Road, Environmental Defense, 2006, see Figure 1). U.S. Government (Government of U.S. Department of State)	
TS-122	B	104	39	105	6	This paragraph neglects an important point: Actions by U.S. states have a long history of influencing U.S. national environmental policy, which in turn has often provided a benchmark for other nations. A classic example is control of air pollutants emitted by motor vehicles. California has led the nation and the world in setting stringent emissions standards for motor vehicles. The U.S. Clean Air Act recognizes California's ability to set more stringent standards, and allows other U.S. states to set standards that mirror California's. The potential consequences of having several states with stringent motor vehicle emissions standards, effectively creating two separate motor vehicle markets within the U.S., was a significant factor in the U.S. government's promulgation of and the auto industry's acceptance of both the national low emission vehicle standards adopted in the 1990s and the more stringent U.S. federal "Tier 2" emissions standards, adopted in 2000. Many other examples are available in the U.S. context. In this sense, actions by sub-national governments have indeed led to nationally significant emissions reductions for criteria air pollutants (NOx, volatile organic compounds, etc.). There is no reason to believe that this approach would not also prove effective for GHG emissions abatement. Beyond the dynamic by which state standards can induce national action, state standards themselves can have a measurable impact. California's GHG emissions standards for motor vehicles have been adopted now by 10 other states, together comprising nearly 30% of the U.S. auto market. These standards would require a 30% reduction in new vehicle GHG emissions by 2016. If these standards survive a lawsuit recently filed by the auto manufacturers and dealers, they could ultimately force a significant reduction in the GHG emissions of new motor vehicles sold in the U.S. Ultimately, this would also be globally significant, given that U.S. light duty vehicles are responsible for about 4 to 5% of global carbon emissions (DeCicco and Fung, Global Warming on the Road, Environmental Defense, 2006,	Accept (Chap 13 – Noted)

						see Figure 1). U.S. Government (Government of U.S. Department of State)	
TS-1478	A	104	4	104	13	The subjective comment starting with "on balance" is not reflected by the discussion in the full text and must be deleted. Furthermore, this paragraph clearly does not reflect that both voluntary agreements and voluntary actions have resulted in significant emissions reductions. The latter topic is discussed within the full text. (,)	Reject
TS-1479	A	104	41	104	41	this sentence needs revision to make it more understandable. (Joe Asamoah, International Energy Foundation)	TIA
TS-123	B	104	43	104	45	"There is no evidence ….lead to significant national emission reductions" Incorrect. See comments on section 13.4.1.2: several industries have reduced their non-CO2 GHGs emissions significantly. (Government of European Community / European Commission)	TIA
TS-124	B	105	8	109	30	Section 13.4 on International Agreements seems to be much more heavily weighted in the TS than the other parts of Chapter 13. For example in Chapter 13 the sections on National Policies and on Initiatives from Sub-national and Non-governmental groups are given 36 pages, with the section on International Agreements being given 38 pages. In the TS, however the former have only 2 pages, while the latter has 5 pages. This may reflect a lack of balance in the TS authorships treatment of chapter 13. (Government of Australia)	Tsu : Accept (Chap 13 – TIA)
TS-1480	A	105	10	105	11	It is hard to argue that Kyoto has set a "significant precedent" or that it has provided "a means to solve a long-term environmental problem." It could be easily argued that the Montreal Protocol has also set up financial mechanisms (the MLF) and has actually "solved" the ozone issue. (Nick Campbell, ARKEMA SA)	Noted.
TS-1481	A	105	10	105	11	Kyoto Protocol sets target by 2012. It cannot possibly be called "a means to solve a long-term international environmental problem". (Koji Kadono, Global Industrial and Social Progress Research Institute(GISPRI))	Reject
TS-1482	A	105	11	105	20	This paragraph appears to be written from the point of view of essential support for the Kyoto framework but greater effort in the future. It ignores the considerable literature that questions the basic approach outlined in the Protocol. In fact, what is striking in the economics and political science literature on Kyoto (at least in the U.S.) is the degree to which the Kyoto framework is found wanting. Any balanced discussion of Kyoto should highlight this literature. U.S. Government (Government of U.S. Department of State)	To be considered (Chap 13 - Reject)
TS-125	B	105	11	105	20	This paragraph appears to be written from the point of view of essential support for the Kyoto framework but greater effort in the future. It ignores the considerable literature that questions the basic approach outlined in the Protocol. In fact, what is striking in the economics and political science literature on Kyoto (at least in the U.S.) is the degree to which the Kyoto framework is found wanting. Any balanced	See TS-1482

						discussion of Kyoto should highlight this literature U.S. Government (Government of U.S. Department of State)	
TS-126	B	105	11	105	13	Substitute “the most noteable achievements” with less laudatory and more neutral terminology, such as “noteworthy effects” are…”. Add “array of policies in developed countries.” U.S. Government (Government of U.S. Department of State)	Reject
TS-127	B	105	13	105	15	delete this sentence as it assumes that the only reason emissions trading has taken place is due to the Kyoto Protocol and it also assumes that a global scheme will eventually be implemented. (Government of Australia)	Reject
TS-1483	A	105	14	105	14	It is suggested to delete "an". (Government of Austria)	Accept
TS-128	B	105	14	105	14	Delete "an" (Government of Australia)	Accept
TS-1484	A	105	17	105	17	It is suggested to delete one full stop. (Government of Austria)	Accept
TS-129	B	105	17	105	17	Editorial-13.4 International agreements '…terminations of baselines and additionality..' delete extra fullstop. (Government of Australia)	Accept
TS-130	B	105	17	105	20	replace "However ... emitters." by "However the Kyoto Protocol has a limited effect on atmospheric GHG concentrations, unless it is followed-up by measures that achieve deeper reductions implemented by all major sectors and countries." (Government of Netherlands/Ministry for the Environment)	TIA
TS-131	B	105	32	105	33	Delete "such as those of the Kyoto Protocol". (Government of Australia)	TIA
TS-1485	A	105	38	105	38	will have to be environmentally effective (Joe Asamoah, International Energy Foundation)	TIA
TS-132	B	105	38	105	41	As discussed above, the analysis has jumped from four to seven desirable principles/criteria. (See p. 103 line 12-14.) and needs tightening. (Government of Australia)	To be considered; see also TS-109 on Page 198 TIA
TS-133	B	106	5	105	31	The authors need to explain why maintaining a healthy/sustainable economic growth/wellbeing for the global population cannot be the long term goal and why we should be trying various alternatives. With sustainable growth as the goal, climate change/concentration targets, etc. will follow as a consequence. Without such an encompassing framework, the problem of justifying a specific climate/concentration target remains no matter what goal is chosen. (Government of Australia)	Reject
TS-1486	A	106	11	106	11	Suggest to insert after the word "goals" the followings. "as well as on what constitutes "dangerous anthropogenic interference under Article 2 of the UNFCCC".	Reject

						(Mitsutsune Yamaguchi, Teikyo University)	
TS-1487	A	106	13	106	17	Has IPCC determined that 650ppm is a "low-level of stringency" - this appears to be a policy recommendation. (Nick Campbell, ARKEMA SA)	Reject
TS-1488	A	106	13	106	17	Is 650ppm a "low-level of stringency" ? - this looks like a judgment (Jean-Yves CANEILL, EDF)	Reject
TS-1489	A	106	14	106	16	The term 'a technology focused approach that only reduces emissions in the future' is confusing - all approaches are technology focussed in the broader meaning of the word and short-term emission reductions driven by market-pull deployment mechanisms will also drive technical progress (Iain MacGill, University of NSW)	Noted
TS-1490	A	106	14	106	17	Are the example concentration levels CO2-only? The examples are described by CO2-eq on line 16, p.107. You should describe "e.g. 650 ppmv CO2eq" and "e.g. 450 ppmv CO2eq" in consistency with the description on line 16, p.107. However, the examples of concentration levels would confuse readers due to large impacts of IPCC. I recommend you to delete the example levels rather than the modifications. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	TIA
TS-1491	A	106	19	106	31	These paragraphs appear to be an attempt to "hide" policy recommendations under the title of "options" - it should either be completely deleted or a number of other options added to make it consistent with the IPCC remit. (Nick Campbell, ARKEMA SA)	Reject
TS-1492	A	106	21	106	21	Typo error. "Such a goal might bebased..." (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accept
TS-1493	A	106	21	106	21	…stabilization GOAL. Such a goal might BE BASED (Joe Asamoah, International Energy Foundation)	Accept
TS-1494	A	106	21	106	21	The following editorial changes are suggested: .. or a stabilization goal. (delete one full stop). Such a goal might be based (insert a blank after "be") ... (Government of Austria)	Accept
TS-134	B	106	28	106	31	The discussion of hedging strategies should be given a similar prominence as the discussion of clear goal setting. At present the text is far too heavily weighted in favour of clear goal setting. (Government of Australia)	TIA
TS-1495	A	107	8	107	19	Inclusion of a reference to the relevant chapter of the underlying report would be very much welcomed. (Government of Austria)	Noted
TS-1496	A	107	10	107	11	The expression "i.e. 450 and 550 ppm CO2rq" is policy prescriptive, therefore should be deleted. (Mitsutsune Yamaguchi, Teikyo University)	Reject

TS-1497	A	107	10	107	11	"(i.e. 450 and 550 ppmv CO2 eq.)" should be deleted. This is vey policy prescriptive. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	Reject
TS-1498	A	107	10	107	10	It is strongly suggested to substitute "during the next century" by either "during this century" or by "during the 21st century". (Government of Austria)	TIA
TS-1499	A	107	11	107	13	"(on the order of -10% to -40%)" and "(-40 to -95% below 1990 levels)" should be deleted. If you will not, the calculating conditions for the numbers should be described. (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	TIA possibly include explanation from revised Table 13.8 as a footnote
TS-1500	A	107	11	107	13	This presumes a particular differentiation between developed and developing countries, and is not policy neutral in this form. U.S. Government (Government of U.S. Department of State)	Reject
TS-135	B	107	11	107	13	This presumes a particular differentiation between developed and developing countries, and is not policy neutral in this form. U.S. Government (Government of U.S. Department of State)	See TS-1500
TS-1501	A	107	21	107	21	highly DEPENDENT on the (Joe Asamoah, International Energy Foundation)	Accept
TS-1502	A	107	23	107	23	It is suggested to substitute "cost" by "costs". (Government of Austria)	Accept
TS-1503	A	107	26	107	28	This statement would be important, but doesn't appear to be entirely correct. Surely, if an allocation regime were to either include or exclude a country like China up to 2030, then the economic impact of this choice on that country would be much larger than if the allocation regime is a given and the choice is only about the target level? Please check and clarify/explain this apparently too generic statement. (Andy Reisinger, TSU IPCC Synthesis Report)	Reject
TS-1504	A	107	38	107	38	MECHANISMS. (space period) (Joe Asamoah, International Energy Foundation)	Accept
TS-1505	A	107	40	107	47	After noting the trade-off between costs and certainty in achieving an emissions level (line 47), it should be said that there is no good basis for determining the 'right' level of future emissions. Thus reducing cost uncertainty to improve political acceptability may be worthwhile, even at the cost of somewhat increased environmental uncertainty. (Frank Jotzo, Australian National University)	Noted
TS-136	B	107	40	107	47	After noting the trade-off between costs and certainty in achieving an emissions level (line 47), it should be said that there is no good basis for determining the 'right' level of future emissions. Thus reducing cost uncertainty to improve political acceptability may be worthwhile, even at the cost of somewhat increased	See TS-1505

						environmental uncertainty. (Government of Australia)	
TS-137	B	107	50	107	51	Delete the first sentence of this paragraph as it implies that the authors have a set model for an emissions trading scheme that they are discussing. Replace with "International market based approaches can offer a cost effective means of addressing climate change if they incorporate a broad coverage of sectors and countries". (Government of Australia)	TIA
TS-1506	A	108	7	108	7	Typo error. "...the international log is in not functioning..." (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	Accept delete “in”
TS-1507	A	108	7	108	7	The following wording is suggested: .. the international transaction log is not yet functioning, ... (Government of Austria)	See 1506 A
TS-138	B	108	20	108	20	Editorial Replace 'programmes' with programmes' (Government of Australia)	Accept
TS-1508	A	108	37	108	37	The following wording is suggested: … national level with actions taken by the …. (Government of Austria)	Accept
TS-1509	A	108	43	108	43	The following wording is suggested: …. of existing technology and policy tools. (Government of Austria)	Accept
TS-139	B	109	0	0	0	table TS.22, please add explanation for "0"-score (Government of Netherlands/Ministry for the Environment)	TS-139-TS-143 (on Page 210) all deal with Table TS.22 TIA
TS-140	B	109	0	0	0	table TS.22, comment: the categories in this table do not correspond to the categories of policy instruments and international agreements in chapter 13; there is no relation between the text in the table and the scoring (e.g. "can be effective" results in either a +, - or ?); there is a bias in the table towards emission trading which is said to be highly cost effective, which increases with broad participation; economic efficiency of a trading system however also depends on the design and rules of the system and the number and size of entities participating; there are no scores given for institutional feasiblity; table needs to be redesigned completely (Government of Netherlands/Ministry for the Environment)	TIA
TS-1510	A	109	1	0	0	Delete Table TS22. This is extremely policy-prescriptive with one-sided information. (Koji Kadono, Global Industrial and Social Progress Research Institute(GISPRI))	TIA
TS-1511	A	109	1	0	0	Table TS.22 harmonise legend with Table SPM-3 to explain symbols. (Government of Spain)	TIA
TS-141	B	109	1	109	0	Table 22 - The value signs [+,-,?] are misleading, as they are entirely context dependent. They should be deleted. For example, “environmental effectiveness” of national emission target depends on participation, stringency and compliance	TIA

						(currently low on all counts) – so this should be "?" The same is true of each of the categories – the effectiveness or ineffectiveness of an agreement in addressing any criterion is dependent on its specific design. U.S. Government (Government of U.S. Department of State)	
TS-1512	A	109	2	109	2	Table TS.22. Environmental effectiveness of cap & trade is marked as "+". However, as described in the table, it depends on participation, stringency and compliance. Given the fact that the total GHG emissions from Annex 1 countries that ratified the Kyoto Protocol is around one third and it is expected to shrink to 20% in 2050, participation is crucially important. In this sense, I think mark for cap & trade should be "?". It is important to make it clear that cap & trade under current participation never be environmentally effective. (Mitsutsune Yamaguchi, Teikyo University)	TIA
TS-1513	A	109	5	109	50	In Table TS22 it is important to explain the meaning of symbols used in columns 3, 5, 7 and 9(essentially, +, -, ?, 0) (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	TIA
TS-1514	A	109	5	109	0	Table TS22: I can not agree with the table at all. This table should be deleted. (the same comment to Table SPM3) (Keigo Akimoto, Research Institute of Innovative Technology for the Earth (RITE))	TIA
TS-1515	A	109	5	109	5	Table TS.22 - See comments for SPM Table 3. The value signs [+,-,?] are misleading, as they are entirely context dependent. They should be deleted. For example, "environmental effectiveness" of national emission target depends on participation, stringency and compliance (currently low on all counts) – so this should be "?" The same is true of each of the categories – the effectiveness or ineffectiveness of an agreement in addressing any criterion is dependent on its specific design. U.S. Government (Government of U.S. Department of State)	TIA
TS-1516	A	109	5	109	5	Table TS. 22 Row 5: Same as table SPM.3 - Finding that technology cooperation generally does not meet criterion seems to run counter to emphasis and importance placed on technology development and transfer throughout report. U.S. Government (Government of U.S. Department of State)	TIA
TS-142	B	109	5	109	30	The authors need to provide a detailed explanation of the methodology for this table and provide a key explaining the symbols used. (Government of Australia)	TIA
TS-143	B	109	5	109	0	Table TS. 22 Row 5: Same as table SPM.3 - Finding that technology cooperation generally does not meet criterion seems to run counter to emphasis and importance placed on technology development and transfer throughout report. U.S. Government (Government of U.S. Department of State)	TIA

TS - 1521	A	10	22	10	22	Second characterisation (ie 'integral') might better be described as 'development and climate first' (Government of Australia)	
TS - 1522	A	24	20	24	25	Abbreviation for Global Warming Potencial shoul be corrected (Government of Czech Republic)	
TS - 1523	A	34	27	34	28	comment: we suggest to shorten this rather prozaic sentence by deleting "complete 'what' and 'where' flexibility, i.e. there is" (Government of The Netherlands)	
TS - 1524	A	42	46	42	46	The statement that economic and regulatory instruments have been employed with limited success needs to substantiated. Certain policies, such as for the promotion of CHP, renewables, fuel switch or increasing efficiency have been quite successful in a number of countries around the globe. It is not clear what is meant with "limited success". (Walter Ruijgrok, EnergieNed)	
TS - 1525	A	43	26	43	28	This sentence is not valid for wind energy renewable (Government of Czech Republic)	
TS - 1526	A	46	29	46	29	The statment that CO2 reduction is limited compared to gasoline doesn´t apply for ethanol produced from sugarcane. When this raw material is used more than 80%of the gasoline emission is abated. This is a very important point and it is very useful to distinguish results obtained when using corn and sugarcane. (Jose Roberto Moreira, Institute of Electrotechnology and Energy, University of Sao Paulo-IEE-USP)	
TS - 1527	A	63	2	63	3	Is the sentence " Regional projections…" supported by data? (Government of Czech Republic)	
TS - 1528	A	69	26	69	29	as stated in comments to chapter 8: emissions from this sector are more or less as high as the potential mitigation potentials (5643Mt CO2) and the economic potential is as high as the same potential for forestry, this should be explained. Furthermore, it should be reflected what is stated in lines 26 to 32 at page 71, lines 35-38 and 41-42 at page 72 of TS. It is not plausible why the expectations about the mitigation potential of this sector are that high. (Government of German Federal Environment Ministry)	Accepted. This is because 90% of the potential comes from enhancing C stocks (i.e. increasing negative soil CO_2 emissions - decreasing soil C emissions). This will be better clarified in Chapter 8 as it has caused some confusion among reviewers. A mitigation potential similar to forestry was also found in IPCC SAR and TAR so this is not so surprising. The mitigation potentials are not particularly high – indeed they are entirely consistent with all previous global assessments including IPCC SAR, TAR, SR-LULUCF and other global assessments (e.g. Caldeira et al. (2004).
TS - 1529	A	71	13	71	14	the part in the parentesis is not explained in the underlying chapter. Furthermore it is to be questioned whether C sequestration reduces risk of drought. Shouldn't it	Accepted. Yes it should read "impact of drought"

						read " reduces impact of drought" (Government of German Federal Environment Ministry)	
TS - 1530	A	71	26	71	32	This statement should lead to conclusions in estimating mitigation potentials (Government of German Federal Environment Ministry)	Noted. We can assess the technical and economic mitigation potential, but the impact of barriers in 2030 are impossible to quantify as they will depend upon what policies are put in place between now and then to help realize the potential. We can quantify the potential, identify the barriers and in some cases even list the impacts that various policy options might have on emissions, but ultimately it is how these policies are implemented between now and 2030 that will determine how much of the potential is realized. We do not know what these policies will be between now and 2030.
TS - 1531	A	86	42	86	42	The following wording is suggested: E.g., the use of biomass … (Government of Austria)	
TS - 1532	A	101	0	100	0	Table TS.21, row bio-energy production; second column: It is suggested to substitute "forestation" by afforestation in porder to add clarity. (Government of Austria)	