Expert and Government Review Comments on the IPCC WGIII AR5 Second Order Draft – Chapter 15

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
31265	15					the chapter is rather theoretical. It does not refer to the lessons learned from applied policies and already deployed measures.	Noted- this has been addressed.
31710	15					The change represented by Cuba from 2007 to 2012 is incorrect because in Cuba in 2012 year exist a National Policy Against Climate Change; a Chapter dedicated to Climate Change exist in National Environmental Strategy 2011- 2015 with goals ans actions related to mitigation and adaptation measures. Both are approved by Cuba´s Ministries Council.	Cuba was originally scored 2 in 2007 and 3 in 2012 because that they had a national environmental strategy that lasted from 2007 till 2010 (http://www.edf.org/sites/default/files/9623_Cuba_Enviro_Strategy_2007-2010.pdf). No web information was originally found when searched for post-2010, and the official Government web site was down. Based on the information provided by the reviewer, we re-searched the web site http://www.cubadebate.cu/noticias/2011/05/09/descargue-en-cubadebate-los-lineamientos-de-la-politica-economica-y-social-pdf/ ; http://www.cepal.org/cgi-bin/getprod.asp?xml=/ccas/noticias/paginas/6/49316/P49316.xml&xsl=/ccas/tpl/p18f.xsl&base=/ccas/tpl/top-bottom.xsl;and www.one.cu/.../energiarenovables/inventarionacional2011.pdf Based on this search for 2011 onwards the document indeed has a section on reducing GHG emissions The lineamientos mentioned do not explicitly mention the reduction of GHG emissions. They do have Energy efficiency and other climate relevant, but nothing explicit on reducing emissions. The Grupo Nacional de Cambio Climático (National Group on Climate Change) (GNCC) still appears to exist so there is a coordinating body. Based on this, we scored Cuba “2” for 2012.

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31711	15					In other sense, in our Sixth Congress of Cuban Comunist Party celebrated in 2012 year were approved the Economical and Social Lineaments that guide the economic and social development and changes of our country in the next years. Lineaments 133, 240-254(en especial 242,245,246,247) are related with a coherent measures against climate change, development of renewable energies, and energetic efficiency and reduction of GHG emissions in the economy sectors. For this reason Cuba in 2012 year is in the group of Formal, legally binding climate strategy in dark blue colour	Cuba was originally scored 2 in 2007 and 3 in 2012 because that they had a national environmental strategy that lasted from 2007 till 2010 (http://www.edf.org/sites/default/files/9623_Cuba_Enviro_Strategy_2007-2010.pdf). No web information was originally found when searched for post-2010, and the official Government web site was down. Based on the information provided by the reviewer, we re-searched the web site http://www.cubadebate.cu/noticias/2011/05/09/descargue-en-cubadebate-los-lineamientos-de-la-politica-economica-y-social-pdf/ ; http://www.cepal.org/cgi-bin/getprod.asp?xml=/ccas/noticias/paginas/6/49316/P49316.xml&xsl=/ccas/tpl/p18f.xsl&base=/ccas/tpl/top-bottom.xsl;and www.one.cu/.../energiarenovables/inventarionacional2011.pdf Based on this search for 2011 onwards the document indeed has a section on reducing GHG emissions The lineamientos mentioned do not explicitly mention the reduction of GHG emissions. They do have Energy efficiency and other climate relevant, but nothing explicit on reducing emissions. The Grupo Nacional de Cambio Climático (National Group on Climate Change) (GNCC) still appears to exist so there is a coordinating body. Based on this, we scored Cuba “2” for 2012.
31712	15					References to these material may be seek in: http://www.cubadebate.cu/noticias/2011/05/09/descargue-en-cubadebate-los-lineamientos-de-la-politica-economica-y-social-pdf/ ; http://www.cepal.org/cgi-bin/getprod.asp?xml=/ccas/noticias/paginas/6/49316/P49316.xml&xsl=/ccas/tpl/p18f.xsl&base=/ccas/tpl/top-bottom.xsl; and www.one.cu/.../energiarenovables/inventarionacional2011.pdf	Based on the work submitted for publication, which relied on a methodology of scanning websites. This website will be examined. I am limited by language abilities and will have to find some help to check this site.

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32068	15					In the map that show the dinamic 2007-2012, the clasification of Cuba is not correct. Cuba have environmental policy regading Cliomate Change and regarding mitigation actios, I think that the showen in the map clasification must be in the firs level (Dark __Blue) level, The proposal of changes is based on the main politicar Document aproved in the VI Congress the Cuban Cominist Party , and then then in the Parlament . "Lineamientos Economicos y Sociales " that gives the ,main guidelines for economic , social and environmental changes in long terms. Guidelines No 133, 240-254(en especial 242,245,246,247) are related with a coherent measures against climate change, development of renewable energies, and energetic efficiency and reduction of GHG emissions in the economy sectors.	Noted. Map removed in final draft, replaced by regional information.
32631	15					This is structurally a great table which could really add to governmental udnerstanding of the policy issues, but to do this I think It might need to be considerably developed. I have commented on the column headings (notably, "Removing barriers"). The authors could consider a first line in the table to give a brief indication of the underlying causal factors involved (eg. pricing: private sector response to changes in relative prices; next colume; satisficing, behavioural, organisation and contractual complexities (perhaps with wroding from the bottom line of the table); long term investments; R&D / IP market failures; lock-in effects through existing infrastructure and institutions; etc etc. Obviously, the poilcy instrument examples coudl be considerably expanded as well. The "context" line of the table could perhaps also be developed mroe carefully - the context for the second column woudl really be where energy prices are a marginal factor in driving decisions, the context for the third column would be where the returns to investment are publci goods, hard to apprpriate, highlly uncertain, highly contingent on future pricing or other policy, or involve regulated assets such as most infrastructure.	Table removed
34439	15					A box highlighting key issues for LDCs as included in almost all other chapters should be added to the chapter.	Noted- this has been included.
32295	15					What is the reason to site Sweden and UK here? Sweden enjoys large amount of hydro and nuclear power while UK has replaced its coal power plants by gas. You are comparing oranges and apples.	Noted.
20194	15					International policies to facilitate technology transfer should provide financing for the transmission of know-how and the aquisition of the required licenses to undertake local production. The sale of equipment does not represent a genuine form of technology transfer.	technology transfer is the province of chapter 13.

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32237	15					The section on capacity building is incomplete because it only considers governance and institutional capacity building in developing countries and, therefore, by implication, could be interpreted that as meaning that capacity building is unnecessary in OECD countries. The failure of a number of OECD countries to introduce climate policies capable of meeting emissions reduction targets suggested by IPCC4 would suggest that capacity building is still needed in key areas, notably: leadership capacity (15.10.1) and public offices vs. private sector (15.10.3). As indicated elsewhere in these comments, a significant proportion of these capacity building efforts in OECD countries relate to how governments manage political obstacles to climate policies by business groups and electorates. Arguments made in Chapter 3 (3.7.1.4 Institutional feasibility, political feasibility, p. 61) infer that political feasibility is mainly determined by policy design to improve environmental and economic effectiveness and distributional equity. These are clearly necessary conditions but they are not always sufficient. Achieving political acceptance also depends on the wider range of political tactics employed by governments to counter the political capacity of potential opponents. These include: (i) how measures are communicated; (ii) the development of package deals to compensate or alleivate overall burdens for affected parties (these include but are not restricted to co-benefits); and (iii) strengthening the bargaining position of government's relative to other political actors, for example by developing cross-party alliances on climate change, integrating climate and energy ministries, and developing so-called spillover policies that, once introduced create functional or political momentum for their extension or strengthening (e.g. emissions trading schemes expanding in scope) (ref: Bailey, I. and Compston, H. 2012 Political strategy and climate policy in rapidly industrializing countries, In Bailey, I. and Compston, H. (eds) Feeling the Heat: The Politics of Climate Change in Rapidly Industrialising Countries, Basingstoke: Palgrave Macmillan, pp. 205-230.). All of these represent political and institutional capacity building and link directly to the themes in 15.10.1-15.10.3. At the very least, the scope and limitations of the Capacity Building section should be identified. A more satisfactory approach would be to add brief analysis of where continued capacity building among OECD countries is required, covering the two sections identified above.	That capacity is needed globally is now stated although the focus is still on developing countries, reflecting the priorities of earlier negotiations and actual needs. The revised structure is now more in line with this comment. Ref included.
32632	15					Institutional investors are emerging as a hugely important focus of debate at least in the UK and Europe. See my final comment on the SPM.	noted. Chapter 16 discusses this.
28979	15					It appears that only explicitly "green" finance is addressed, not broader financial instruments or funds. If this is implied, it could be more explicit. If other funds are irrelevant, that should be explictly stated as well.	Accepted. Thank you.
33023	15					This section misses a discussion of innovative financing, as e.g. is described in Chapter 1, p. 11 lines 28-32.	Noted.

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32238	15					Given that the opening of the chapter asks why institutions and governance matter in climate policy, the concluding section seems to lose much connection to ideas of institutions and governance and, instead, focuses solely on policy instruments. In other words, it does not give due weight to the importance of political choices in the choice and design of policy instruments. A more rounded conclusion would include a statement that a wide range of political pressures shape these choices and that, although some evidence exists on the ways in which political opposition from business, electorates and opposition parties (for instance) influence choices about policy instruments, further analysis is needed to produce a more systematic overview of how these pressures affect climate policy development in different political jurisdictions and policy areas, and how they might be governed more effectively. Some of the more detailed analyses of this include: Giddens, A. (2011) The politics of climate change, second edition, Cambridge: Polity Press; Bailey, I and Compston, H. (eds) 2012 Feeling the Heat: the politics of climate policy in rapidly industrialising countries, Basingstoke: Palgrave Macmillan; and Compston, H. and Bailey, I. 2012 Climate Clever: how governments can reduce emissions and still win elections, Abingdon: Routledge.	This has been rectified. Thanks.
32680	15					Perhaps important to note synergies between certain governing regimes and particular policy types or emissions performance. There is a large literature on effect of democracy, for instance. See the work already cited in chapter 15 - Lachapelle and Paterson (forthcoming).	Introduced in new Sec 15.2.6
32623	15					A paper by Klinsky (2013) gives some very interesting insights into climate governance in context of the rise and fall of the Western Climate Initiative. In touching on carbon pricing developments also valuable to note the BC carbon tax / refer forward to p.22 on that.	Inadequate space to get into details of carbon price development. Not added.
32677	15					General comment: Reading this section it was a bit unclear to me why the different policies and measures used to evaluate policies (elaborated in section 15.4) were not systematically applied to all the types of policies and measures examined in section 15.5. For instance, under discussion of Taxes, Charges, and Subsidy Removal (15.5.2) there are sub-sections for two criteria (environmental effectiveness and distributional incidence) only.	this has been changed.
32625	15					The authors may find some of the data and analysis in the "Markets and Pricing" chapters of our book Planetary Economics (Grubb et al, 2013)(helpful, as final text was updated in March 2013. Chapter 6 looks briefly at price evidence and carbon tax impacts; Chapter 7 surveys evidence particularly on EU ETS including free allocation, instability etc; and Chapter 8 analyses the distributional issues arising, both consumer and industrial impacts including carbon leakage and border-related issues as well as consumer impacts.	Noted.
33082	15					One point that emerges from this section is that taxes on individual sectors is not as efficient as an overarching tax. This is a very useful point, that Is not highlighted in the summary.	Agreed. ES contains this now.
23129	15					Take into account the following empirical literature: Ekins, P.; Pollitt, H.; Summerton, P.; Chewpreech, U. (2012): Increasing carbon and material productivity through environmental tax reform, in: Energy Policy, 42, p. 365–376; Agnolucci, P. (2009): The effect of the German and British environmental taxation reforms: A simple assessment, in: Energy Policy, 37, p. 3043–3051	Noted

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32684	15					This section touches upon the issue of political acceptability of carbon pricing. I think it is important to note that most of the polling work I've seen, including my own in Canada and the U.S., documents that ear-marking the revenue for re-investment in renewable energy is by far the most popular option for revenue use derived from carbon pricing among the public. Though unpopular with departments of finance, who are traditionally opposed to ear-marked taxes, this seems a promising way to increase aceeptability when selling carbon pricing. There is a link here to be made with taxes on gasoline/diesel, which have been linked to road maintenance as a means of increasing their political acceptability. See Figure 11 in Lachapelle, Erick, Christopher P. Borick and Barry Rabe. 2012. Public attitudes toward climate science and climate policy in federal systems: Canada and the United States compared. Review of Policy Research 29(3): 334-357.	Accepted. Added
30104	15					There is a considerable literature on the political economy lessons from the EU ETS(exemptions and free allocation) that this section can benefit from e.g.Grubb, M. (forthcoming) Planetary economics, Chaper 8.; and Sato, Neuhoff, Graichen, Schummacher and Matthes (forthcoming) Sectors under scrutiny - Evaluation of indicators to assess the risk of carbon leakage in the UK and Germany, Environmental and Resource Economics, forthcoming, 2013.	Noted.
32626	15					See previous comment on section 15.5.2. Here on "has ETS worked" it would seem essential to refer to the various studies of emission savings estimates that we survey in our book, and also I think helpful to emphasise that whilst ETS has had a direct impact on operational savings, and probably a strategic indirect impact on investment particularly in deterring new carbon intensive plant, it has so far failed to deliver any significant direct bankable incentive for low carbon investment	Noted. Chapter 14 in Section 14.4.2 assess the performance of the EU ETS, and addresses both its environmental and economic effectiveness.
41962	15					This section can be more up to date - this recent review may be useful. Calel (2013) Carbon markets: a historica overview. Wiley Interdisciplinary Reviews: Climate Change, 4(2), 107–119. Available from: http://wires.wiley.com/WileyCDA/WiresArticle/ wisId- WCC208.html.	This has been revised. Thank you.
30102	15					Again, I feel the last 4 years of advancement in the understanding of EU ETS imapcts and design issues (market power and carbon leakage) is missing this section. Unfortunately there is no timenow but I am happy to povide more indepth comments if requested. These recent review may be useful. Calel (2013) Carbon markets: a historical overview. Wiley Interdisciplinary Reviews: Climate Change, 4(2), 107–119. Available from: http://wires.wiley.com/WileyCDA/WiresArticle/ wisId- WCC208.html.; Laing, T., Sato, M., Grubb, M., and Combert, C. Assessing the effectiveness of the EU Emissions Trading System. February 2013. Working Paper, Grantham Research Institute, London, UK.http://www2.lse.ac.uk/GranthamInstitute/publications/WorkingPapers/Papers/100-109/WP106-effectiveness-eu-emissions-trading-system.pdf; Martin, R., Muûls, M., & Wagner, U. (2012). An Evidence Review of the EU Emissions Trading System, Focusing on Effectiveness of the System in Driving Industrial Abatement. Technical report, Department of Energy and Climate Change. Available from: https://www.decc.gov.uk/assets/decc/ 11/cutting- emissions/eu- ets/5725- an- evidence- review- of- the- eu- emissions- trading- sys.pdf.	Noted. Analysis of recent developments of the EU ETS are discussed in Chapter 14, Section 14.4.2.

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32627	15					The terminology "Regulatory approaches" is a little problematic though I cant think of anything better. Perhaps just stress that it spans a huge range of policies. As already indciated, I find the explanatory focus on "Barriers to the adoption of energy efficiency" to be a very narrow framing of a far broaderr set of phenomena. I am really not sure whether the three examples should be left, expanded, or replaced by cross-reference to their inclusion in other parts of AR5, but the few references are curiously dated. AR5 has a lot of material but it is possible the review of the theory and evidence around "First Domain" effects in Planetary Economics (Grubb et al, 2013, Chapter 4) may be helpful. One recent and interesting example - a "hybrid" instrument that is closely aligned to analysis of decision-making structures - is the UK 'CRC Energy Efficiency Scheme'. This was targeted deliberately to leverage both the financial and the CSR drivers in a sector identified as having large energy efficiency potential - less energy intensive business and public sector organisations (retail, commercial, schools, government estate, etc). The underlying analylsis of barriers and drivers that informed its design, and the instrument itself, are described in Grubb et al (2009); it came into effect in 2011, I have been told that government data shows an 11% reduction in energy consumption in the sectors covered in the year following its introduction, if of interest to the Ch15 authors I coudl attempt to verify this and provide a citation.	Noted.
23130	15					The assessment is clearly biased in favour of VAs. Please rebalance the text and underpin it with evidence from the relevant literature. Suggestion: Replace by "Voluntary agreements have a rather mixed outcome with regards to their environmental effectiveness. They are effective alternatives to mandatory regulations when the target is to achieve small environmental improvements at relatively low cost (Borck and Coglianese 2009). A credible threat of regulation is required in order to achieve stringent targets (Baranzini and Thalmann 2004). Under specific cultural circumstances, such as in Japan, voluntary agreements can also work in the absence of a direct regulatory threat (Wakabayashi 2012) . There, they provide high flexibility and are politically highly feasible."	accepted text modified

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32628	15					Is there a specific reason whey the title is "Technology policy and R&D polciy" rather than "Innovation polich"? Overall this section has a great deal of very good material but I have three suggestions. A very effective communication devise in this area is the "Innovation chain" which has now appeared in many different variants in innumerable publications, including last years IEA innovation report. It is helpful because it shows the continuity along with the different steps and the points at which the chain can be broken, and hence what policies need to do to bridge the resulting gaps. It is true it is simplified - there are of course feedbacks - but I still think it might help the accessibilty of the section to use some variant of the innovation chain diagram. On intellectual content, I woudl strongly suggest that the AR5 - either here or in Chapter 7 - includes data on the private R&D intensity of different sectors. Whilst some care is required (for example, significant parts of energy innovation can be classified under engineering companies), the fact remains that electricity and construction in particular are notable for exceptionally low levels of R&D intensity - around one tenth of that prevalent in IT and pharmaceuticals, for example. This provides an explicit indication of the reality and importance of the "technology valley of death". Data and some discussions of the reasons for these sectoral differences are in Chapter 9 of Planetary Economics (Grubb et al, 2013). When coupled with the recognition of general economic underspend on innovation, this creates powerful reasons to believe that enhanced efforts on energy sector innovation across the chain would be economically beneficial. Finally, I think this section should be cast more broadly recognising that the wider innovation challenge does also involve infrastructure and institutions - see my comment on overall AR5 in this regard. There is a strong literature on the centrality of institutional innovation linked wtih technology innovation. As a very concrete example, it is now evident that innovation in offshore wind involves changes way beyond pure technology / innovation chain bridging incentives. It involves massive infrastructure investment in grid, and extensive institutional innovation - the UK energy regulator Ofgem for example is undertaking wholesale reform of its structures for regulating transmission to try and get synergies from onshore, offshore, and interconnectors, which currently operate under three different and incompatible regulatory regimes. This is a reform of huge complexity, but with huge potential payoffs in terms of reduced barriers to entry and better access to a wider range of energy resources and balancing services (Ofgem, Integrated Transmission Planning and Regulatory Reform, consultation document 2013; see also House of Lords, Select Committee on European Affairs report 'No country is an Energy Island', published 2nd May 2013). This illustrates my central point, that innovation more broadly - "Third Domain" processes - are about far more than just failures in intellectual property markets.	Noted. The title was dictated by the plenary. The "innovation chain" formulation is useful, but as technology is one small aspect of this chapter there is not enough space to address it. Similarly, the issue of private R&D is a complex one, and the policy levers are unclear. Fundamentally, the thrust of these comments would be appropriate for a chapter on technology, but that is not what this is.
32685	15					On synergies and interactions, existing levels of carbon energy taxation and subsidies need to be taken into account when developing climate policy. Some have called for a climate-related audit of the fiscal system to better establish what policies may potentially enter into conflict with climate policy objectives. For an example see Lachapelle, Erick. 2011. The hidden factor in climate policy: Carbon taxes. Sustainable Prosperity Policy Brief. http://www.sustainableprosperity.ca/article900	valid point. This could be included in a sentence or two in 14.7.4.2.

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32629	15					This section on interactions could be a strong "drawing together" point of the chapter, if the literature exists to support it - I suspect indeed the authors have had to struggle with a seriously inadequate literature in this area and if so might point that out. Perhaps reflecting this, the section at the present seems to fall short of what might be hoped. Attempting to extend literature in this area is a core part of the concluding chapter of our book Planetary Economics (Grubb et al, 2013), Chapter 12, which attempts to map the relations between the different domains. For example, economic instruments can kick people out of Satisficing behaviour and provide funds ffor energy efficeincy (Domain 2=>1); conversely, enhanced efficiency is vital for political viability of economic instruments (Domain 1=>2); carbon pricing may generate both incentives and resources for innovation (Domain 2=>3) whilst innovation is crucial to expand the option set of responding to risingg energy prices (Domain 3=>2). There are also some direct links between Domains 1 and 3 (for example, harnessing consumer preference for advanced technologies such as hybrid vehicles).	perhaps it would suffice simply to add, parenthetically: "(See chapter xx for discussion of several sources of emissions leakage.)"
32630	15					the Klinsky article on the rise and fall of the WCI (in Climate Policy, 2013) may be of interest to this section	rejected -- the reviewer's point pertains to the rebound effect, which is considered elsewhere in the chapter
32686	15					A key issue going forward here, related to climate policy at the sub-federal level, is resiliance of early action. We are starting to see the limits of sub-national leadership, which was taken under the assumption that others would follow suit. At least in North America, where progress has been slow, many sub-federal entities are backing off. Witness proposals to freeze the BC carbon tax, or the backing out of the WCI by many one-time members.	NOTED (Section 15.7 deals with the beneficial and problematic interactions between climate policies conducted at different jurisdictional levels) /*15.7/
23478	15					Section 15.5 does not follow the classification of policy instruments defined in section 15.3	Noted. Modified.
35326	15	0				The analysis in this chapter on the national policy assessment on adaptation, technology, finance and capacity building neglects the assessment of the needs of developing countries in respective aspects. It is suggested to add corresponding discussions in the chapter and emphasize the significance of these needs to developing countries. For example, many countries have already conducted Technology Need Assessment (see http://unfccc.int/ttclear/jsp/CountryReports.jsp). This chapter shall assess the needs of developing countries in technology, finance and capacity building based on these TNA reports and other relevant reports.	Noted. Developing country examples have been inserted.
35327	15	0				Since AR4, developing countries have conducted tremendous domestic voluntary actions and made great contribution to global efforts in addressing climate change. This chapter does not provide a comprehensive assessment on these actions and their contribution. It is strongly suggested to add such assessment to this chapter, and corresponding conclusions should be reflected in the SPM. Many studies reach the conclusion that emission reduction efforts made by developing countries are greater than that of developed countries, which is of high agreement and high evidence, and should be used in the underlying report and SPM. Relevant references include UNEP The Emissions Gap Report (UNEP 2010 and its appendices), Climate Action Tracker (Climate Analytics et al. 2010; Chen et al. 2011; Höhne et al. 2011), McKinsey & Company Climate Desk v2.1 (McKinsey & Company 2011), (Erickson et al. 2011) and Frank Jotzo (Jotzo 2010), (Wei et al, 2012).	Noted. It is difficult to assess the specific contributions of developing countries. Please see 15.2 for a discussion on how policies have changed since AR4.
35328	15	0				Discussion on technology transfer is insufficient in this chapter. Thus, it is suggested to add a systematic and coherent discussion on technology transfer to Chapter 15, focusing on domestic intellectual property rights and TT.	technology transfer is the province of chapter 13.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
34020	15	0				The treatment of the international cooperation option "Linking of domestic emissions trading schemes" is dispersed across Chapters 13, 14 (14.3.2.1), and 15 now, and requires integration. It seems obvious that the major treatment should be in Chapter 13, with Chapter 15 adding the national perspective and effects on this option. Even within chapters, integration can be improved: In Chapter 13, treatment of linking ETS is now dispersed across Sections 13.4.1.3, 13.6, 13.7.2, and 13.13.2.1 with the latter two offering the most comprehensive list of relevant references and offering the qualitatively best review of the topic which should be the point of reference of all other reviews of the overall WGIII report. In Chapter 15 the issue is treated in 15.5.3.6, and in 15.8.1 where the treatment is remarkably sloppy without references, not taking into account (in terms of quality of content, and referencing) the level of the available peer-reviewed literature. It is not obvious that this topic should be treated in Chapter 14. As a side note, the following publication attempts to offer a comparative analysis of different international emissions trading architectures and may be useful in structuring the assessment of linked schemes: Flachsland, C., R.Marschinski, O. Edenhofer (2009): Global Trading versus Linking. Architectures for international emissions trading. Energy Policy 37, 1637–1647.	This is discussed in Ch13. This chapter discusses interactions.
34021	15	0				In the sections on climate policy instrument appraisal, it would be critical to carefully review the scarce available literature that offers an integrated comparison of climate policy instruments, the economic or other rationales for their application (multiple externalities), and in particular an integrated analysis of the consequences of combining these instruments. Three principal publications analyzing these issues in a partial and general intertemporal equilibrium model, respectively, are Fischer and Newell (2008), Kalkuhl et al.(2013), and Kalkuhl et al. (2012). Only the first is cited and treated very briefly now in the text. A more elaborated review of these key publications, of course complemented by other work in the area (but usually not using intergrated models with multiple market failures analyzing multiple policy instruments), would substantially beneft the chapter and might even form the backbone of it. The two full references currently not treated are: (1) Kalkuhl, M., O. Edenhofer and K. Lessmann (2013). Renewable Energy Subsidies: Second-best Policy or Fatal Aberration for Mitigation? Resource and Energy Economics, 35(3), 217-234, and (1) Kalkuhl, M., O. Edenhofer and K. Lessmann (2012). Learning or Lock-in: Optimal Technology Policies to Support Mitigation. Resource and Energy Economics, 34(1), 1-23.	More balance has been sought in the revised draft in climate policy instrument assessment.
32621	15	0				This is a strong chapter with coherent and interesting intellectual structure. My main generic comments relate to the three main categories of instruments the authors elaborate. First, perhaps the authors could have a fuller debate about the wider content and naming of the these. "Economic instruments" is fine and clear. "Barrier removal" seems too limited for the range of phenomenon covered: this category could be usefully linked back to the Chapter 2 discussion of "System 1" decisionmaking (though see my comments on that), it really concerns the innumerable processes in individual, organisational and collective decisionmaking which mean that societies are always operating some distance behind the "best practice frontier"; the policy challenge is what can bring them closer, and faster, and in lower carbon directions. That can be complex and a mix of barrier removal, education & skills, institutional development, and incentive structures aligned to decision-making processes. See example of the UK CRC. The title of the 3rd leg ("Long term policies for new techh and infrastructure" is fine but the scope of explanation needs widening. Finally, even though this chapter does a better job of "policy integration" than anything I have seen, it could still do better to underline why policy packages are essential and to map out some of the main synergies.	The framing table has been removed.

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40534	15	0				More specifically, Ch 15 and the introduction need to mention the most significant barriers to energy efficiency: the principal – agent or split incentive problem, the structural problem with traditional electric utility regulation, consumers' high discount rates, and some of the best policies, such as decoupling, energy efficiency portfolio standards, appliance efficiency standards, and building codes that have been remarkably successful in reducing energy demand and promoting economic growth. The single most important issue ignored by the report is the distorted market structure that rewards utilities and other energy suppliers to sell more power and punishes utilities for making customers more efficient, even if the cost of efficiency is far less than the cost of supply. Polices such as "decoupling" sales from profits that have been implemented in California and elsewhere, reverse the profit incentive and motivate utilities to provide energy services through efficiency rather than increased sales. The report fails to mention this concept anywhere, even though it is the best means of harnessing private sector capital, resources, knowledge, and reducing transaction costs. Together with appliance efficiency standards and building codes, decoupling dramatically improves energy efficiency at low cost. See Steven Ferry, "Sale of Electricity" in The Law of Clean Energy: Efficiency and Renewables (Michael B Gerrard, ed. American Bar Association 2011); publications of American Council for an Energy Efficient Economy; National Action Plan for Energy Efficiency Research Group, "Aligning Utility Incentives with Investment in energy Efficiency" (US EPA December 2007); Dan York, Patti White, Seth Nowak and Marty Kushler, "Three Decades and Counting: A Historical Review and Current Assessment of Electric Utility Energy Efficiency Activity in the States: (ACEEE Report U123 June 2012)	This has been discussed to some extent in the new version.
40535	15	0				Formidable barriers impede the deployment of energy-efficient technologies, even if their adoption is projected to save money over time. Large states such as California and New York have overcome many of the barriers. This cutting edge experience provides valuable lessons for national, state, and local policy makers in the leadership skills required and the most effective policies to pursue. Market failures and barriers include unpriced costs and benefits, low priority of energy issues, distorted fiscal and regulatory policies undermining efficiency, incomplete markets for energy, misplaced or split incentives, lack of access to capital, insufficient and inaccurate information and high internal discount rates. Detailed studies of particular markets have found multiple and substantial barriers inhibiting the adoption of cost-effective energy efficiency improvements. National Academy of Sciences "Real Prospects for Energy Efficiency in the United States" (National Academy of Sciences; National Academy of Engineering; National Research Council 2010)	Noted. This is disussed in the technology policy section.
40536	15	0				"Energy efficiency improvement is often hampered by market, financial, informational, institutional and technical barriers. These barriers exist in all countries, and most energy efficiency policies are aimed at overcoming them." The major barriers market organisation and price distortions that prevent customers from appraising the true value of energy efficiency; split incentive problems created when investors cannot capture the benefits of improved efficiency; high transaction costs relative to energy savings); up-front costs and dispersed benefits discourage investors; the perception of energy efficient investments as complicated and risky; lack of awareness of financial benefits on the part of financial institutions; lack of sufficient information and understanding, on the part of consumers, to make rational consumption and investment decisions;	Noted.
40537	15	0				Regulatory and institutional barriers include energy tariffs that discourage energy efficency investment (such as declining block prices); incentive structures that encourage energy providers to sell energy rather than invest in cost-effective energy efficiency; institutional bias towards supply-side investments, and insufficient capacity to identify, develop, implement and maintain EE investments.	Noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24942	15	0				Completeness - Saitama's (Japan) emissions trading scheme is not discussed in this Chapter. If not a deliberate omission, suggest referencing it. Suggested references (English): http://www.pref.saitama.lg.jp/uploaded/attachment/53920.pdf (more up-to-date Japanese language reference): http://www.pref.saitama.jp/page/haisyututorihiki.html	Noted.
22220	15	0				The chapter is entitled "policies and institutions" but is primarily about policy. Despite discussion of political structures (e.g. federalism) and institutional capacity issues, there appears little discussion throughout of the institutional context as a facilitator/inhibitor of mitigation between and within different countries	This has been addressed to the extent possible.
22221	15	0				The overview of country policies is not an accurate representation of the state of play or of the literature. Country work on LEDS is not reflected, the number of countries with pledges has been misquoted. There are also problems with the methodology to identify whether a country has a climate policy which leads one to say that Colombia or the US has not policy which is not accurate.	Noted. This has been improved.
23474	15	0				The chapter is too theoretical and does not provide a balanced view on the different types of policy instruments. Policy makers who want to get an overview of key policy instruments and design lessons will get a wrong picture.	Agreed. The new draft is less theoretical.
23475	15	0				The chapter should take the perspective of policy makers and provide some guidance how to appraoch the challenges of policy making for CC mitigation. In ist current form, it is not helpful and rather misleading.	noted.
23476	15	0				The chapter tends to have a bias for "economic"/"market based" instruments and does not provide a neutral overview of the pros and cons of different policy instruments.	Noted. This has been taken into account in the revisions.
23477	15	0				Deployment policies for renewable energy and energy efficiency technologies should be discussed more dominantly (corresponding to their important role in climate change mitigation). Discussing them only shortly under 15.6 "technology and R&D policy" gives a wrong picture and downplays their importance. They should already be discussed under "economic instruments" and/or "regulatory approaches".	Noted. A separate section highlights the role of technology policy.
22541	15	0				A multilateral process should not be exclusively top down. We are seeing ever increasing actions on both adaptation and mitigation undertaken at the national, subnational and regional levels. We have learned over the past few years that the path forward cannot be either a top down (intergovernmental regulation) or a bottom up exercise (domestic policies, business action, public engagement). The path forward has to be the result of concurrent, mutually reinforcing efforts that help us to spiral up toward the tipping point of transformation	International cooperation is discussed in Chapter 13. This chapter discusses bottom up processes where relevant.
33026	15	0				Chapter misses any discussion of short-lived pollutants, noting that e.g. the incentives to limit these pollutants may be even more substantial because of their links to e.g. particulate pollution and thereby human health concerns. There is an introductory discussion of this in Chapter 1, p. 17 lines 22-24 that could be used as referernce.	Noted.
33069	15	0				The chapter presents two overarching frameworks: the first apperas in 15.6 and includes emission reduction policies, R&D policies and technology deployment policies; the second first appears in 15.8 (and the ES) and includes carbon-pricing policies; barrier removal policies and long-term policies for technology and infrastructure. The first framing (that appears in 15.6) is better related to the structure of the chapter and more straightforward for ther eader to link to the policy categories introduced in Chapter 3. As such, it would be useful to pull this framing throughout the chapter.	These framings have been revised.
33070	15	0				While there are some exceptions (e.g. Section 15.5.6), the lessons from the sector chapters are only weakly applied and referenced. The ideal to place to pull the lessons from the sector chapters may be in 15.6.3 in the discussions of technology deployment policy. There may also be opportunity to pull lessons into 15.5.4 and 15.6.3.	This has been addressed significantly in the new version.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
33071	15	0				It would be very important to strengthen the link between Chapter 15 and the other Policy chapters (13,14 and 16) Please pay particular attention to Section 13.7, which discusses the influence of international policy on national policy. These discussions could be reflected and strengthened in Chapter 15 and extended to cover how national policy may then help feed into international policymaking.	Noted.
33072	15	0				While the chapter has improved as a whole, there are several sections that will require a dedicated effort leading to the final draft. This includes Section 15.10 and 15.11, where additional expertise may be required.	Additional expertise has been mobilized for these sections.
33073	15	0				The chapter contains a lot of strong, useful messages for policymakers. These messages, however, are often hidden in the chapter text, and have not necessarily been brought forward into the Executive Summary. It would be useful to redraft the Executive Summary accordingly.	Executive Summary has been thoroughly rewritten.
33075	15	0				In the early sections of the chapter there is often mention of carbon taxes or emissions trading schemes that seems to have been injected as afterthoughts, and often interupts the flow of the text. This point can be made while keeping to the overarching structure of the chapter.	Noted.
38602	15	0				The whole chapter should concisely summarize key elements and conclusions from AR4 and then focus on the new literature/insights.	Noted- AR4 used as point of departure.
38603	15	0				There must be more emphasis on education and public awareness, to drive political action. At the present time, there must be close ties between government action and technical mitigation strategies in two ways: (1) governments must subsidize products and policies that lower GHG emissions, especially since such strategies will increase the cost of goods and services and (2) governments must refocus/realign their financial support of research activities in industry, academia, and government laboratories ; such activities are absolute necessary to generate breakthrough advanced and inventions that directly address GHG mitigation.	Role of stakeholders is discussed.
38604	15	0				The chapter should concisely summarize key elements and conclusions from AR4 and then focus on the a crisp assessment of new literature, while simultaneously being revised to be both policy relevant, but not prescriptive. Further, the chapter would be considerably improved if it were to contain consistent, objective treatment of the effectiveness of various policy approaches as well as portfolios of policies.	Noted- the chapter has been revised to achieve balanced treatment across policy instruments.
28126	15	0				Unfortunately, the whole chapter lacks focus. There is a strong bias to emission trading even though other instruments have been much more widely used on the national level. More focus on promising and already successful policies are needed. The linkage between CDM (NAMAs) and national policies are missing. The chapter needs also substantial reorganization.	There has been an effort to achieve balance in the new draft.
35329	15	10				The map here is problematic. It is suggested to change the map. Even if the map has to be remained, it should be replaced by a border free map.	The map is based on work that is forthcoming. It is reproduced from that work.
31156	15	10		10		In the world map of 2012, it is not clear how countries have been classified among four categories 1) Formal, legally binding climate strategy (Dark Blue colour), 2), Political, non-binding climate strategy (Blue colour), 3), None of the above (Light Blue colour), and 4), Not studied. Canada is grouped under category 3 (light blue) while Australia, Brazil and China are shown in category 1 (dark blue) and Argentina, India, Namibia and South Africa are shown in category 2 (Blue). This seems to be an anomaly and an explanation is warranted. It is worth noting that Canada has adopted a political and legally binding climate strategy. In January 2010, Canada announced its greenhouse gas emissions target of 17 per cent reduction from 2005 levels by 2020, under the Copenhagen Accord. Canada has adopted a sector-by-sector regulatory approach to meet this target, and has started implementing this approach already.	The method is more fully explained in 15.2.2. The coding is based on domestic legislation and policy, and not on international pledges.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
20366	15	10	1	11	47	These important and interesting results are not summuarized in the executive summary. This trends shoudl be mentioned in the executive summary.	To be added to ES
38621	15	10	1			This figure is an "apples to elephants" comparison and probably should be dropped. Also, countries in the "none of the above" category may have taken steps that might not be captured in the "formal" or "political" categories. The U.S. would be a case in point.	The map in 15.2.2 is intended to look at one set of actions - formal, national government actions. Other sections looks at steps taken in other categories. The argument given in 15.2.2 is that there are positive effects from these centralized measures, and that is the reason these are worth capturing.
22542	15	11	1	11	28	Spain is also an example of coordination between different administrative levels. The Policy Coordination Committee on Climate Change works with all the "Comunidades Autónomas" to promote actions on mitigation and adaptation to climate change. These regions have an important role in the management of ETS emissions. Regarding to No ETS emissions, in some cases some of these "Comunidades Autónomas", such as Catalonia, undertake actions that go beyond the compliance levels required.	No citation provided, and none found to make this point
29300	15	11	2	11	6	Clarification: "Targets set in the 11th Five-Year Plan achieved a roughly 20% decline in energy intensity (defined as energy consumed per unit GDP) between 2006 and 2011. Internationally, China has committed to reduce carbon intensity (defined as energy-related CO2 emissions per unit GDP) by 40-45% in 2020 from 2005 levels." Implementation methods are discussed below, so recommend deleting.	is is confusion between 11th Plan, which is written about in academic writing, and the 12th Plan about which little has been written. The details fo the Plan have been deleted to avoid confusion.
25787	15	11	24	11	25	This part should be deleted completely because Tokyo CO2 Emission Reduction Program is currently under the special measure for the Great East Japan Earthquake, which allows CO2 emission increase caused by home generation. This means that the program is not implemented under normal condition. Therefore, Tokyo CO2 Emission Reduction Program should not be considered as a good example of carbon markets.	The point here is about independent sub-national action. The Tokyo example provides a case. Whether it is a good example of carbon markets is not the issue. The example is retained.
38622	15	11	25	11	28	CA example could be expanded given AB32 and other regs/rules and agreements with other states/regions/countries. Also RGGI in the US.	No further action. NO cite provided. CA already mentioned, as also RGGI.
21345	15	11	28	11	29	Insert at the end of the paragraph: In fact, the multiplicity of efforts by U.S. states promises significant reductions in national CO2 emissions by as much as 65% against baseline projections (Byrne, Hughes, Rickerson, Kurdgelashvili, 2007) Byrne, J., Hughes, K., Rickerson, W., & Kurdgelashvili, L. (2007). American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State and Local Green Energy and Climate Change Policy. Energy Policy 35 , 4555-4573.	No action. Focus is on institutional arrangements, not target numbers. Also, statements on % reductions inappropriate given complexity of determining baseline and other computational issues, which cannot be discussed in adequate depth here.
21346	15	11	28	11	29	Insert after comment above: The associated policy landscape thus produces a dynamic momentum in the absence of larger federal commitments (Carley & Browne, 2012). Carley Sanya, Browne Tyler R.. Innovative US energy policy: a review of states' policy experiences. WIREs Energy Environ. 2012. doi: 10.1002/wene.58	Cite added to 15.2.5
38623	15	11	29	11	47	The text in these lines could probably be shortened.	Agreed. Done.
35330	15	11	3	11	3	The year here should be 2010 instead of 2012.	Specific dates deleted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24204	15	11	3			Should be 2010 not 2012	Specific dates deleted
28139	15	11	35			Which Sao Paolo law exactly?	Done. Specific law mentioned in 15.2.5 and citation added.
26158	15	11	37	11	47	There is some overlap in the text used in this chapter and in Chapter 12 (p.43) (both written from text developed by the same contributing authors). The lead authors may need to discuss where this text is best placed and ensure consistency between chapters. Chapter 12 adopts the term 'multilevel governance' (used throughout this literature on urban/sub-national responses). Chap[ter 15 makes some of the same points using the frame 'federalism'. Chapter 13 uses other distinctions (decentralised architectures for example). At some point, either distinguishing between these terms and why they are being used, or demonstrating how/why they can be used interchangably will be necessary so that outside observors are able to link up the findings being developed in each of these chapters to get an overall sense of the 'climate governance' picture.	Text deleted here.
20661	15	11	6	11	6	Please add "In its long-term plans until 2020, China aims at a reduction of carbon intensity by 40-45% against 2005, an increase of non-fossil fuel share (in primary energy supply) to 15% by 2020 against 2005, an increase of forest coverage of 40mill. ha and of forest stock volume of 1.3bn m^3 by 2020 against 2005 and the promotion of Green Economy, Low Carbon Economy, Circular Economy and technology development". (Oberheitmann, 2012). Please cite as Oberheitmann, A. and Ruan X. (2012): Low carbon city planning in China. In: Frauke Urban and Johan Nordensvard (Eds.): Low Carbon Development: Key Issues. Text book for Earthscan's Key Issues Series. Routledge: 270-283	Not added due to space limitations, and the fact that this section is not about target setting but linkage across levels of governance. Brief reference to updated 12th Plan targets included in 15.2.5
24201	15	11	1	11	2	Actually, local governments in China have also been playing important role in the determining of reduction targets as well as the reduction action.	changed text in 15.2.5
19979	15	11	1	11	2	Actually, local governments in China have also been playing important role in the determining of reduction targets as well as the reduction action.	changed text in 15.2.5
26824	15	11	28	11	29	After "… Hanemann, 2009)," please insert "Similarly, the city of Malmö, Sweden, has set a target of being climate neutral by 2020, which is significantly more ambitious than the EU's target (49% by 2020) for Sweden and the Swedish National Plan of 50% by 2020 (Source: "IRENA and ICLEI (2013), "Integrating Ambitious Renewable Energy Targets in City Planning – Malmo, Sweden", Renewable Energy Policy in Cities – Selected Case Studies, http://www.irena.org/Publications/RE_Policy_Cities_CaseStudies/IRENA%20cities%20case%207%20Malmo.pdf" .	Grey literature and hence not cited
24202	15	11	3	11	3	The target mentioned here seems to be China's energy intensity reduction target during "the 11th Five-Year-Plan" (2006-2010), which is to reduce the energy consumption per GDP by 20% by 2010 compared to the level of 2005. Now China has its "12th Five-Year-Plan" (2011-2015), which is to reduce the energy consumption per GDP by 16% and the CO2 emissions per GDP by 17% during the five years. Reference see "China's Policies and Actions for Addressing Climate Change (2012)" page 2 http://qhs.ndrc.gov.cn/zcfg/W020121122588539459161.pdf)	Modified to include reference to 12th plan.
19980	15	11	3	11	3	The target mentioned here seems to be China's energy intensity reduction target during "the 11th Five-Year-Plan" (2006-2010), which is to reduce the energy consumption per GDP by 20% by 2010 compared to the level of 2005. Now China has its "12th Five-Year-Plan" (2011-2015), which is to reduce the energy consumption per GDP by 16% and the CO2 emissions per GDP by 17% during the five years. Reference see "China's Policies and Actions for Addressing Climate Change (2012)" page 2 http://qhs.ndrc.gov.cn/zcfg/W020121122588539459161.pdf)	Modified to include reference to 12th plan.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38624	15	12	1	12	39	The section seems to pick and chose examples, is somewhat repetitive with 15.2.2 and is not comprehensive. Suggest major reworking to capture key different approaches systematically vs thru a few limited examples.	Done. The section is re-written to focus on the broader point being illustrated, with countries only used as illustrative examples
20367	15	12	12	12	21	not clear how "sector" is defined here (industry, type of energy …. ???). In the EU the shift from low carbon electricity or biomass policy (2000 & 2003) to renewable energy / climate-energy policies (2007, 2009) is an example of policy becoming less sectoral .	Fair point. But larger trend is being identified here.
32972	15	12	36	13	10	The S. African case focuses specifically on energy policy, which is rather the focus of the sectoral policies section of Chapter 7 - as such it is misplaced here. It would be more useful in this section to focus on the big-picture, i.e. trends seen in policies addressing either one or multiple sectors.	Case removed as a box. Instead, limited to one sentence as an example f a sectoral policy in 15.2.3
24944	15	12	4	12	7	Accuracy - Australia should be included in this list.	language checked to avoid listing countries
32622	15	12	6			If as indicated need reference, three good referneces to UK legislative developments are Stallworthy M. (2009) (for specific institutional and legal dimensions of UK Climate Cahgne Act), Mallaburn and Eyre (2013) on development of energy efficiency legislation, and Fankhauser (2013) for much broader insights into UK policy lessons.	Stallworthy reference included in 15.2.2
21347	15	12	9	12	11	Comment: Empirical evidence of effectiveness suggests that the impact of such delegation of activities can go substantially beyond the limited outcome implied by the word patchwork and represents a significant promise for future mitigation (Byrne, Hughes, Rickerson, & Kurdgelashvili, 2007; Carly & Browne, 2012) Byrne, J., Hughes, K., Rickerson, W., & Kurdgelashvili, L. (2007). American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State and Local Green Energy and Climate Change Policy. Energy Policy 35 , 4555-4573. Carley Sanya, Browne Tyler R.. Innovative US energy policy: a review of states' policy experiences. WIREs Energy Environ. 2012. doi: 10.1002/wene.58	Reference to "patchwork" deleted
22224	15	12				There should be more discussion of the UK Climate Change Act here to balance with actions taken by other countries. Also, there should be greater consideration of the role of the EU as a policy entrepreneur/innovator.	Section re-written to focus on sectoral approaches. More added on UK.
32973	15	12				Where countries are singled out, it may be useful to include a disclaimer explaining WHY those countries were selected to highlight.	Done. The section is re-written to focus on the broader point being illustrated, with countries only used as illustrative examples
29301	15	13	17			Same clarification as above. Energy intensity not energy efficiency.	details of plan removed
20368	15	13	37	13	37	interesting statement, seems logical, but is it evidence-based ? Can you provide some evidence supporting this statement ? How is institutional "simplicity" defined in this specific case ?	Text deleted here.
38625	15	13	39	14	3	This section seems counter to the prior sections. The AR should be reporting on the literature on effectiveness of various approaches vs broadly covering institutional approaches.	This is a summary section. Sufficient evidence does not exist to report on effectiveness of alternative instituitonal designs. Instead, the section reports on alternative instituitonal approaches and why and how they prevail.
38626	15	13	47	14	2	Can this be justified by the literature? Need citations.	this summarizes previous material which is cited

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26598	15	13	8			: France 7 (Mathy, 2007) and Italy (Massetti et al., 2007) have no overarching national legal climate framework, 8 but operate within the framework of EU directives. FALSE! Take out reference to France Mathy. See below, next comment	References to France modified. This is a very interesting point regarding the importance of sub-national planning, but unfortunately no citations are provided.
19982	15	13	12	13	23	China implement its target by both decompose the target into the provincial level and the sectoral level. And the characteristic of provincial approach is more obvious.	Reference to provincial level added
19981	15	13	17	13	17	same as above	Reference to provincial level added
38628	15	14	20	14	20	Why not put all definitions in a text box and then the main text focus on literature assessment?	Noted.
32624	15	14	24		28	Border-related issues apply equally whether tax or trade. I would incline to omit the para here, and to note after following para that a challenge on all economic instruments is that they current apply to production not consumption and hence riase teh challenge of whether and how it might be possible to equaklise carbon costs beteen producers and consumers for example through border related measures - maybe with the references but then refer forward to that section	This has been addressed.
22606	15	14	28			Suggest to add "Others again warn that border tax adjustments may turn out to be ineffective or even counter-productive (Jakob and Marschinski, 2012)." Jakob, Michael, and Robert Marschinski. "Interpreting trade-related CO2 emission transfers." Nature Climate Change 3.1 (2012): 19-23.	Noted. Text on border taxes has been qualified.
26754	15	14	37	14	39	The words “and individualist” do not make sense in this context. Perhaps the sentence is intended to be: “They establish a rule and/or objective that must be fulfilled by firms and individuals and can be …”	Accepted.
38629	15	14	37	14	37	The text here is an overstatement. Many regulations are not put in place to address climate. And "ALL" implies every country. The text needs to be revised accordingly.	Noted. Changed.
26850	15	14	41			Consider inclusion of the following- For instance, even at the early stages of development, the authorisation procedures to connect to the grid can be overwhelmed by large number of project applications. Hence a strategy is needed to allocate the connection points to all projects. Inadequate planning can lead to costly delays and losses to the project developers and utilites. "IRENA (2012), 30 Years of Policies for Wind Energy: Lessons from 12 Wind Energy Markets (pg. 26), http://www.irena.org/DocumentDownloads/Publications/IRENA_GWEC_WindReport_Full.pdf"	Noted.
32975	15	14	42	14	42	It is inappropriate to say '…since carbon pricing is not enough' here. This section is simply introducing different policy instruments, and is not evaluating anything at this stage. Nor is any reference provided. Recommend deleting this phrase.	Accepted.
38630	15	14	42	14	42	As written, the statement is too strong. The paragraph should recognize a range of options . The authors should also change "is" to "may" in paragraph. A more balanced discussion is needed of pros and cons of portfolios of options such as carbon pricing vs regulatory option.	Noted.
38631	15	14	42	14	42	This line states an opinion; it is not a conclusion of the literature. In fact, this whole section is void of appropriate literature citations.	Noted. Text has been revised to make it consistent with the AR5 guidelines
38627	15	14	5	14	10	Is it not the IPCCs charter to review and assess, as comprehensively as possible the literature on policy instruments and packages, not the policy instruments and packages themselves? This should be both comprehensive, and based on sound literature review and assessment.	Noted- balancing has been sought.
22468	15	14	4			As already mentioned in relation to Chapter 3 (see above), it would be useful if AR5 could establish a definitive categorisation of climate policies that could be widely used by ensuring that each category of policy instruments includes a list of all the main specific types of policies that come under it, rather than just examples. In particular it needs to be made clear exactly where feed-in tariffs and quotas for low carbon energy fit in.	Noted. The taxonomy follows the AR5 general guidelines; same is applied to maintain consistency.
22225	15	14	4	15	26	Perhaps the sections on different instruments could be made more equal in length and content? This section paradoxically stresses the importance of an appropriate policy mix but gives most attention to economic instruments. In fact, there appears to be a strong "economic" bias throughout the chapter.	Noted. The chapter has been revised more broadly to take this into account.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
29565	15	14	4			I would like to commend the authors for significantly improving these two subsections. To improve the structure further, I suggest to split section 15.3.1 into two ("Taxes, Charges, and Subsidy Removal" and "Emissions Trading") so as to follow the same structure as subsection 15.5	Sections 15.3 and 15.5 have been made consistent.
33079	15	14				Subsidies/subsidy removal was introduced at the beginning of this section, but was not discussed in the subsequent paragraphs.	Noted. Subsidies are fully discussed under 15.5.
32681	15	14	28	14	28	Another critique of this policy relates to different conceptions of justice and fairness. Punitive border tax adjustments may punish countries less likely to have higher rates of effective prices on carbon - in the developing world - forcing these countries to forego cheaper forms (at current prices) of fossil-based energy, thereby impeding their development, while these forms of energy were used to develop in the industrialized world.	This has been noted.
32974	15	14				This section is fundamentally different than the other sections in 15.3 and not necessarily usefully so. It misses the focus on the mechanism of the policy and the different approaches to the policy, which is done in the other sections and is more useful to the reader.	Accepted. Changed.
28140	15	15	1		3	Argumentation somewhat unclear. It might be the case that the agents are to a certain extent rational, but there are just no appropriate incentives to act rationally. If they are not, as argued here, how can the government make the actors more rational?	Noted- this section has been revised.
22607	15	15	1			There should probably be a citation here, for example Enkvist, P., Tomas Nauclér, and Jerker Rosander. "A cost curve for greenhouse gas reduction." McKinsey Quarterly 1 (2007): 34.	thank you.
26851	15	15	12			Consider inclusion of the following- The awareness and involvement of local communities in the development of a new technology is a factor of success in the deployment phase, as seen from the global experience with wind energy deployment. "IRENA (2012), 30 Years of Policies for Wind Energy: Lessons from 12 Wind Energy Markets (pg. 24), ttp://www.irena.org/DocumentDownloads/Publications/IRENA_GWEC_WindReport_Full.pdf"	Noted
22608	15	15	16			Suggest to add: "Voluntary agreements are sometimes substitutes for regulation that would otherwise have been imposed, making them less than completely voluntary."	Noted
32976	15	15	17	15	18	Sentence reading "Moreover, the removal….should be included in this policy type" does not fit here without either further explanation or justification.	Noted
38634	15	15	27	16	29	Overall, this section coiuld use improvement in that there are few new literature and few references to evaluation approaches and methods. The authors should shorten the text and rework it.	Taken into account. Section has been substantially reworked.
26849	15	15	4			Consider inclusion of the following- However, analysis of 30 years of polcies for wind energy in 12 different markets yields that can be "no-one-size-fits-all" approach to designing a successful policy and regulatory framework for any country or market. Each country has its unique set of macro-conditions, historical situation and political constraints, all of which are key considerations. "IRENA (2012), 30 Years of Policies for Wind Energy: Lessons from 12 Wind Energy Markets (pg. 27), http://www.irena.org/DocumentDownloads/Publications/IRENA_GWEC_WindReport_Full.pdf"	Noted. Suggested reference is not relevant to the section as it has ended up based on others' comments.
38635	15	15	40	15	40	The text should be revised to read "...what would have likely to have occurred..."	Accepted; text changed.
38632	15	15	5	15	26	Sections 15.3.3-.5 are definitional and could be condensed into a text box. Extremely thin on literature and any insights if these approaches are effective alone or as part of a portfolio, at the national/subnational level.	Accepted in part and rejected in part: points 2 and 3 have been addressed. Addressing point 4 explicitly would require more space than can be devoted to this subsection. Implicitly, section 15.5 addresses this as it considers each relevant evaluation study.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38633	15	15	6	15	6	The lack of information may be a market failure, but the assertion that this is a market failure in this situation is simply an assertion. Where is the empirical evidence that lack of information is a market failure? The market failure is that there is an unpriced externality. The authors need to reivse the text accordingly and add appropriate citations.	Rejected. The revised text deals only briefly with CGE modelling, so the further detail suggested here would not be appropriate.
32221	15	15	12	15	12	More direct forms of public information policy aimed at raising public awareness and concern about climate change to promote mitigation actions are not mentioned in Information Programs. The UK's Act on CO2 initiative is one example of an initiative that is distinct from the more indirect approach of eco-labelling mentioned in the current text, because of its direct focus on personal action on climate change and advocacy of a series of actions (switching off lights and stand-bys, and reducing room heating slightly).	Agreed.
33076	15	15				The information is very crisp, which is helpful, but it misses some connecting elements to the rest of the chapter that would be useful to the reader. Bullets could be reordered to focus on answer the following main points: 1) Explaining methods for collecting information on policies (done well in current draft) 2) Explain how those methods are applied in the chapter (done weakly in current draft) 3) Explain how information collected relates to evaluation criteria - e.g. can all methods inform all evaluations? (missing in current draft) 4) Explain which criteria were applied to which instruments to arrive at conclusions in 15.5 (missing in current draft)	This section has been revised.
20296	15	15	33	16	38	At an international level, there is also a lack of transparency on methods diffferent countries use. An attempt to provide greater clarity on national emiss baselines and methods for their development is provided in Clapp & Prag (2012), "Projecting Emission Baselines for National Climate Policy: Options for Guidance to Improve Transparency", OECD/IEA Publishing, http://www.oecd.org/env/cc/CCXG%20(2012)3%20National%20Baselines.pdf	Noted- this section has been revised.
38637	15	16	15	16	17	A word or phrase is missing from this sentence. Please review and revise as necessary.	Rejected. This is the section explaining what method help needed to understand what kind of evidence, and therefore it is appropriate in here.
38638	15	16	15	16	22	While lab experiments can be useful, the extent to which any particular experimental results can be generalized depends on the experimental design. Designs that rely on undergraduate students may not be very generalizable.	Page and section citations do not make any sense (starting on page 5, continuing through page 25; section 31).
32977	15	16	3	16	7	Is theoretical information applied only when ex-post information was not available? How did the chapter approach which type information to reference? I.e. what was preferable? Please clarify the system used in the chapter to approach the assessment.	Noted. CGE models have been placed in the broader context of simulation methods. General discussion of the appropriate use of different models for different questions is covered in the framing chapters rather than here.
29302	15	16	31			Recommend removing. The question -- "what kind of evidence" -- is not addressed here, and is covered in section 15.5.	Accepted. Text has been revised.
38636	15	16	9	16	14	It is not just the impacts on multiple market, but it is the possibility of the impacts being large enough to affect the macro economy. While CGE models have become a standard approach, these models are highly stylized and how they are parameterized significantly affect the results. The text should be revised accordingly.	Noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
26520	15	16	14			…after "2006)." include: " Particular General Equilibrium Models based on Input-Output analysis and Social Accounting Matrix are utilized to assess social co-benefifs and net employment effects. Climate policy scenarios can be projected in terms of social outcomes, income distribution and job creation. Comparing busienss as usual to renewable energy scenarios enable policy makers to take informed decisions and - while often social and employment effects are likely to be positive - to overcome blocked descisions because of climate uncertainty. Source: Ronald E. Miller and Peter D. Blair 2010, Input-Output Analysis Foundations and Extensions; Miyazawa, K., 1976: Input-Output Analysis and the Structure of Income Distribution; Brad R. Ewing et al., Integrating econogical and water footprint accounting in a multi-regional input-output framework, in Ecological Inticators 23 (2012); ILO, Assessing Green Jobs in Developing Contries 2011; German Ministry for Environment 2006, Renewable Energy: Employment effects; GHK 2011, Evaluating the potential for Green Jobs in the next Multi-annual Financial framework	Noted. The text has been revised to reflect this reviewer's point, though perhaps not as strongly as the reviewer would desire.
32222	15	16	15	16	22	The section on laboratory experiments with experimental economics feels rather misleading because it does not explicitly state that such experiments are hypothetical and, therefore, that there is a high likelihood that preferences expressed will match up poorly with real-world decision-making outside of laboratory conditions. A caveat to that effect should be added.	Accepted. Text has been revised.
32223	15	16	28	16	29	Qualitative analyses and case studies are given rather cursory treatment because the description fails to explain in adequate detail how such approaches can complement and add greater depth to quantitative techniques. These benefits could be encapsulated briefly with a statement to the effect of: 'Qualitative analyses and case studies can provide useful complements to quantitative analyses by providing greater detail on the specific factors influencing the stringency and pace of climate mitigation policies in particular countries that may enable greater progress to be made in addressing factors hindering policy development. Such factors include: the social and economic circumstances of a country, features of national energy systems, the political acceptability of climate mitigation policies to opposition political parties, business groups or the electorate.' A good reference for this would be: Bailey, I., MacGill, I., Passey, R. and Compston, H. (2012) The demise of the Australian Carbon Pollution Reduction Scheme: A Political Strategy Analysis, Environmental Politics, 31 (5), 691-711: doi:10.1080/09644016.2012.705066, which provides detailed analysis of the political and economic factors influencing climate policy development in Australia.	Noted. Text has been revised to address the issue of generalizability.
20295	15	16	8	16	14	I was surprised to see only CGE modelling mentioned for policy simulation and evaluation. Other modelling approaches should also be mentioned, e.g. bottom -up or sector specific engineering/cost tools. It should be noted that each tool has strengths and weaknesses for answering different types of policy questions. It is also worth noting the challenges many countries face in determining the most appropriate tools for policy evaluation. Which model types are most suitable to answer which types of policy questions could be fleshed out in more detail in this section. There are many sources of information for a brief comparison of model types - one suggestion is: Clapp et al (2009), "National and Sectoral GHG Mitigation Potential: A Comparison Across Models", OECD/IEA publishing, http://www.iea.org/publications/freepublications/publication/Mitigation_potentials.pdf.	Accepted. This point and this reference have been incorporated in the text.
24945	15	17	10	17	17	This seems to overstate the benefits of a carbon tax compared to emissions trading - suggest removing section describing a border adjustment carbon tax as an 'administrative cost minimizer' (is inconsistent with p. 23, lines 12-14). Also, suggest adding: "However, carbon taxes do not provide certainty that a country will achieve its emissions reduction targets or international commitments. Carbon taxes are also more difficult than ETS to integrate at an international level due to the possible need to adjust for other existing implicit carbon taxes in each country."	Noted. Text revised in part.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38639	15	17	10	17	14	This is a very incomplete discussion of the administrative costs associated with implementing a tax. The administrative costs depend on many more factors that simply specifying the legal incidence of the tax.	Noted but limited space has meant brief discussion overall.
22227	15	17	15	17	30	Another important reason is that the environmental outcome is uncertain as it's hard to assess ex-ante how economic actors will react to the tax. In a Kyoto world with absolute binding targets, this may be perceived as a disadvantage over other economic instruments such as cap and trade.	Accepted. Added.
24946	15	17	16	17	18	The statement that Australia has a carbon tax (temporarily until it switches to an ETS) is an oversimplification. There is also currently some conflict between this section and the section that describes Australia's ETS as starting in 2012 (page 24, line 42). In the first three years, Australia's carbon price is fixed (starting at A$23 and rising to $25.40) - which is why it is sometimes referred to as a "carbon tax". However, the architecture of the carbon pricing mechanism is very similar during the fixed-price phase and during the flexible-price phase - permits can be traded in both phases; points of liability are the same; and free allowances are allocated in the same way. The administrative arrangements for the carbon pricing mechanism are separate to the administrative arrangements for Australia's taxation system. It would be more accurate (and avoid confusion) to explicitly state that Australia's emissions trading scheme has a fixed price for the first three years.	Noted. Text modified.
38640	15	17	16	17	18	The term 'significant' is subjective in this context. One might argue that none of the taxes are "significant' in that they have had little direct impact on emissions of those jurisdictions.	Accepted. Text modified.
38641	15	17	18	17	30	Refrences to literature since AR4 are most important here, and it's unclear why the authors chose to focus on "WHY" a carbon tax has been implemented or not, vs its effectiveness in mitigating emissions. The latter seems much more important to readership, and should be added.	After the introduction, the remaining text focuses on the effectiveness of carbon tax (dist, env etc); carbon tax as a policy choice is briefly discussed in the stakeholders section as well
38642	15	17	31	17	31	How is a "sizable general carbon tax" defined? Suggest dropping the word "sizable."	Objectively, these levels of taxation can be considered "high" or "sizeable"
22228	15	17	32	17	34	It would be useful to be more precise about the scope of this tax.	Accepted. This is discussed later in the section.
38643	15	17	41	17	41	Fuel taxes might be considered a proxy for a carbon tax, but a generally poor proxy. Fuel taxes are basically used to raise revenue to build roads and other transportation infrastructure. The tax rates bear little or no relationship to carbon emissions. The authors should revise the tect accordingly.	Yes, they can be used to finance roads and such as mentioned in the chapter but the impact on emissions can't be ignored.
26755	15	17	5	17	7	Carbon taxes do not in general achieve any given level of 6 emissions reduction in the least costly way possible, they just guarantee that the marginal damage of the remaining emissions is equal to marginal cost (the tax). Only a quantitative instrument insures that an exact level of reductions is achieved	Noted. This discussion is meant to provide a theoretical context though. Emprics discussed later.
22226	15	17	8	17	12	The cost-minimising effect also comes from the fact that there is also an option of non-action if it is more costly than paying tax. Also, the revenue-raising aspects can give rise to "double dividends" by using the revenues to reduce taxes on socially-desirable activities	Accepted. Discussed in the design section.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32224	15	17	19	17	25	This section identifies that carbon taxes may attract hostile lobbying from fossil fuel interests but fails to note that such interest groups can exert a strong indirect influence on the policy process, for example, by threatening to withdraw or delay investment, mounting opposition media campaigns, or by attempting to undermine politicians and political parties proposing the policy measure. The key point that needs to be added here is that such opposition can have political consequences for governments and, therefore, pressure can lead to the dilution or abandonment of the policy. This section already has extensive references, so probably does not need another one.	Accepted. Please see 15.9 for a full discussion on the influence of stakeholders.
32682	15	17	39	18	7	Although carbon taxes are so far uncommon, implicit carbon taxes, for example taxes on transport fuels, are much more widely used. See Lachapelle, Erick. 2011. The hidden factor in climate policy: Carbon taxes. Sustainable Prosperity Policy Brief. http://www.sustainableprosperity.ca/article900	Noted. The document doesn't seem to be peer reviewed though;
38644	15	18	1	18	27	The effectiveness of these taxes re emissions reduction is important and should be covered here, not just below. In fact, the authors seem to neglect the history of the development and use of fuel taxes and erroneously place it as an emissions reduction tax as a principle driver. Further, the comparison to fuel efficiency mandates is weak at best given that history has shown that in spite of fuel prices, transport demand and emissions grow with GDP in all countries, albeit the fuel tax may have a separable impact to reduce the marginal consumption/emissions per km. The overall growth in km/pop/gdp is the primary driver of transport emissions.	Accepted. The balance between fuel tax and carbon tax has been shifted.
22229	15	18	13	18	14	The price elasticity of fuel is known to be very low. This may also motivate alternative regulatory instruments.	Accepted. Hence, short run and long run elasticities distinguished.
26756	15	18	18	18	18	Repetition of “exceeded $500 billion globally” needs to be removed	Accepted. Removed.
38645	15	18	18	18	18	Text is repeated in this line.	Accepted. Removed.
35331	15	18	24	18	27	Energy subsidy is an issue in many countries as concluded in the section above. (Page 18, line 15). All the discussions around this issue in context are on regional level, it is not appropriate to focus only on a single country such as China here. In addition, transitional economies usually refer to Economies in Transition, it is also not appropriate to refer to China as transitional economies. Therefore, it is suggested to remove this paragraph.	Accpted. This is a more general discussion now.
28141	15	18	36	19	13	The low/decreasing carbon intensity of the UK might be partly due to the structural change of the economy from industry to services, which are typically less energy/carbon intensive	The Martin et al study focused explicitly on manufacturing level data.
24205	15	18	24	18	24	Officially, China is usually refered as "developing country" or "emerging economy", not transitional economy. Suggest replacement.	Noted.
19983	15	18	24	18	24	Officially, China do not accept to classify China into transitional economy. Suggest to use "developing country" or "emerging economy".	Noted.
28978	15	18	24	18	27	On energy subsidies, it is not just China, as is noted in the previous paragraph. Perhaps useful to also point out other specific cases. For example, the OECD reports that India's energy subsides in 2006 were 3.4% of GDP, even higher on a per capita basis than China as well (OECD, Economic Survey of India, 2011)	Accepted. This is a more general discussion now.
33080	15	19				Y-axis label is missing	Accepted.
38646	15	19	11	19	13	This statement is stronger than the literature above suggests. Nowhere have the authors considered income taxes or overall taxation --needs to be covered by literature or removed.	Accepted. Text revised.
38647	15	19	14			The authors should label the vertical axis of the figure.	accepted. Done.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
33081	15	19	19	19	21	Please define what is meant exactly by 'short-run' and 'long-run'	Short term is normally 1 year and long term is 5-10 years; this is empirically observed, in terms of responses (even within the long term, the greatest impact is felt within 3-5 years); please see Goodwin et al 2004 for details
38648	15	19	21	19	25	Old literature is cited here; the authors should find more recent sources and contrast to, say, the work of Schaefer, Jacoby et al. while discussing the importance of overall growth of vehicle emissions, vs just the narrow impact of fuel taxes or other instruments.	Noted.
38649	15	19	26	19	32	The authors need to reivse the text here to address questions such as: How were the estimates in this paragraph derived? What caveats go with the estimates? What empirical support is there for the statement that "...fuel taxes [are] arguable the govt policy that has had the largest impact on the climate?" This statement is simply an assertion. What other policies were evaluated? Over what time period? For what countries? What were the underlying assumptions?	accepted; text modified; provides info on methods
32294	15	19	9	19	20	Choice of investment decision is influenced by many factors and fuel/material price prospect is one of them. Often not a sole but multiple factors affect decisions. It is therefore misleading to state that any one factor "had any detrimental effect on economic perforamnce or led to exit from the industry".	Point taken but the Martin et al 2011 study focuses specifically on taxes using data at the manufacturing plant level. They are able to conclude that taxes did not have a detrimental effect.
40763	15	19	11	19	13	This sentence should be eliminated because, logically, the conclusion of this sentence is not always lead from the examples of countries such as Sweden and UK in the chapter 15.5.2.2.	This text has been modified.
32978	15	20				Figure misses a source/reference	Accepted. Changed.
32979	15	20				Please note that in order to conform to the WG III AR5 standard, the units here will need to be converted to $2010	Accepted. Changed to PPP.
38650	15	20	14			The authors should drop the word "stiff."	Accepted. Deleted.
24947	15	20	24	20	24	Misleading reference to fossil fuel subsidy policy - G20 and APEC leaders statements refer to phasing out and "inefficient fossil fuel subsidies that encourage wasteful consumption" and "fossil fuel subsidies that encourage wasteful consumption" respectively - not all fossil fuel subsidies.	Accepted. Language modified.
19984	15	20	25	20	27	The cited literature here is about the impact of technological progress to energy intensity. The literature where the result of policies' impact to energy intensity come out is not clear.	Noted. Text amended
34400	15	20	19	20	24	The reduction of fossil fuel subsidies resulting in strong emission reductions (as stated in the SPM) is a very strong statement that is only based on a single, non-peer-reviewed paper. Indeed, the reduction of fossil fuel subsidies could reduce domestic demand in countries where it is phased out. However, the demand changed can influence world market prices. This effect (and its relevance for climate change) has not been discussed. Also, potential emission reductions from reducing fossil fuels should be put into perspective, e. g. how they related to climate stabilization targets.	This point has been qualified.
38652	15	21	23	22	31	This theme regarding political feasibility, etc seems controversial for IPCC. This assessment should focus on the literature…if such literature covers the political theory, than it can be included - and appropriately cited.	Political and institutional feasibility is one of the criteria used to assess policies across the board.
24480	15	21	24	21	30	I t should be deleted that "people realize the taxes are not damaging the economy", as there is no evidence.	noted
38653	15	21	25	21	25	How is a "...big effect" defined? The authors should re-word it to say something like "...to have a behavioral affect...".	accepted. Thank you.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32296	15	21	28	21	30	Very much depends on the level of fuel prices. These year, citizens in many OECD countries feel fuel prices too high and tax should be reduced.	Partially accepted. This is more of a notion of incremental political acceptability.
23532	15	21	3	21	22	There is now more detailed evidence available that taxes on different types of emissions (e.g. emissions from home energy use, those on motor fuels, flights or transport as a whole or total emissions including indirect emissions) have very different distributional effects. Carbon taxes on home energy are strongly regressive whilst transport related taxes are much less regressive or can even be progressive. It would be important to make this clear here as I think it is misleading to argue that all carbon taxes can be neutral or progressive (see Büchs, M. & Schnepf, S.V., 2013. Who emits most? Associations between socio-economic factors and uk households' home energy, transport, indirect and total co2 emissions. Ecological Economics, 90, 114-123)	accepted. Rewritten.
26096	15	21	30	21	30	The Fuel Duty Escalator from 1993 cannot have been done by Mrs Thatcher's government as she left office in 1990 (see recent issues of most newspapers worldwide); describing the case only by the name of the politician rather than the country probably assumes too much knowledge; and Fuel Duty raised far more money than the government spent on the roads, even before the escalator was brought in. The Conservatives started the policy; Labour continued it, but then stopped raising the tax by much more than inflation after significant public protests about fuel prices. Newbery, D.M. and G Santos, (1999) 'Road Taxes, Road User Charges and Earmarking', Fiscal Studies, 20(2), 103-32; Taxation of Road Fuels, Standard Note SN824, House of Commons Library, 2013	Accepted. Rewritten.
38651	15	21	4	21	22	This section should cover other literature on carbon taxes, not just fuel taxes.	Accepted. Modified.
32683	15	21				Lachapelle 2011 also documents significant differences in tax rates imposed on industry versus household sectors for the same fuels. Lachapelle, Erick. 2011. The hidden factor in climate policy: Carbon taxes. Sustainable Prosperity Policy Brief. http://www.sustainableprosperity.ca/article900	Noted. Doesn't seem to be peer-reviewed though.
29307	15	21	3			The vast majority of citations apply only to developed country contexts. More references are needed to substantiate claims that fuel taxes are "strongly" progressive in developing countries. Note the incorrect reference to Chapter 6.3.5.2 which is on an unrelated topic. The distributional incidence of a carbon tax cannot be equated with the per-capita consumption of a specific fuel (e.g., transportation), but must be viewed across different commodities (e.g., electricity) including macro-economic effects. Equity considerations must also include the relatively higher barriers for households currently without modern energy services to access them if a carbon tax is implemented. Complementary policies to support energy access for low-income households are necessary.	Developing country related citations have been inserted.
40764	15	21	17	21	18	This sentence should be eliminated because there is no explanation of the reason that the benefits from congestion reduction mitigates the regressivity caused by carbon taxes in this chapter.	The explanation is in the text and it is that reduced congestion is a benefit that has to be weighed against the cost of the tax.
26925	15	21	3			The vast majority of citations apply only to developed country contexts. More references are needed to substantiate claims that fuel taxes are "strongly" progressive in developing countries. Note the incorrect reference to Chapter 6.3.5.2 which is on an unrelated topic. The distributional incidence of a carbon tax cannot be equated with the per-capita consumption of a specific fuel (e.g., transportation), but must be viewed across different commodities (e.g., electricity) including macro-economic effects. Equity considerations must also include the relatively higher barriers for households currently without modern energy services to access them if a carbon tax is implemented. Complementary policies to support energy access for low-income households are necessary.	noted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
27045	15	21	3			This section must note that the vast majority of citations apply only to developed country contexts (e.g. the research was conducted only for developed nation contexts). More references are needed to substantiate claims that fuel taxes are "strongly" progressive in developing countries. Note also the incorrect reference to Chapter 6.3.5.2 which is on an unrelated topic. The distributional incidence of a carbon tax cannot be equated with the per-capita consumption of a specific fuel (e.g., transportation), but must be viewed across different commodities (e.g. electricity) including macro-economic effects. Additionally, fuel taxes or carbon taxes create relatively higher barriers to access for households currently without modern energy services to access them if a carbon tax is implemented, raising additional important equity issues. Complementary policies to support energy access for low-income households are necessary (as per discussion in 4.3).	noted
22230	15	22	10	22	11	Doesn't this depend on the way revenues are recycled? A lump sum which is unrelated to the source of taxation is preferable to recycling on the basis of the level emissions.	Noted.
22231	15	22	15	22	19	General comment on terminology: tax revenues go to the general budget whereas fees or charges are earmarked	noted
24948	15	22	21	22	31	This approach also has significant drawbacks in terms of estimating the quantity of abatement to be subsidised. Suggest adding the text: "A significant risk to the abatement subsidy approach is that government and businesses need to quantify the abatement undertaken. This requires estimates of business-as-usual emissions which are highly uncertain for many industries, and may lead to unnecessarily high costs to government."	accepted. Text reflects this now.
38654	15	22	32	22	39	Is this based on literature or assertion? Include citation.	please see citations at the end of the paragraph
31264	15	23		27		crossref with 14.3.2.1	thank you
31157	15	23		28		The section on emissions trading could be enhanced by the example of the Canadian province of Alberta, which has had a GHG emissions cap-and-trade system in place since 2007, with significant trade in GHG offsets. Further information is available at http://carbonoffsetsolutions.climatechangecentral.com/	Not taken. We don't have more space to expand on any particular experience.
30103	15	23	1	23	24	Since the AR4, several papers have analysed carbon leakage using more empirically-based methods, and find statistically significant positive effects, but much smaller in magnitude relateive to modelling studies, and also relative to the paper by Aichele and Felbmayer (2011). See E.g. Aldy, J. E. & Pizer, W. A. (2011). The competitiveness impacts of climate change mitigation policies. NBER Working Papers 17705, National Bureau of Economic Research, Inc. Available from: http://www.nber.org/papers/w17705.pdf.; Gerlagh, R. & Mathys, N. A. (2011). Energy abundance, trade and industry location. Nota di Lavoro 003.2011, Fondazione Eni Enrico Mattei, Milan. Available from: http://www.feem.it/ userfiles/attach/20111171430134NDL2011- 003.pdf.; Michielsen, T. O. (2013). The distribution of energy-intensive sectors in the USA. Journal of Economic Geography. Available from: http://joeg.oxfordjournals.org/content/early/2013/01/15/ jeg.lbs045. and Sato and Dechezlepretre (2013) Asymmetric industrial energy prices and international trade; Grantham Research Institute on Climate Change and the Environment Working Paper	Text on leakage revised.
22232	15	23	12	23	14	This statement should be further substantiated. It should also say under what conditions they could be made coherent with trade agreements (e.g. non discrimination).	This has been revised.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
23533	15	23	15	27	39	It seems too narrow here to only consider existing carbon trading schemes - should other schemes that have been discussed widely in the literature also be reviewed, including different options for up-, mid- and downstream caps; different allocation mechanisms; different compensation mechanisms, etc.? (e.g. see Fawcett, T., 2010. Personal carbon trading: A policy ahead of its time? Energy Policy, 38 (11), 6868-6876; Barnes, P., 2003. Who owns the sky?: Our common assets and the future of capitalism Washington D.C.: Island Press; Feasta, 2008. Cap & share. A fair way to cut greenhouse emissions. Dublin: The Foundation for the Economics of Sustainability (FEASTA); Aea & Cambridge Econometrics, 2008. A study in personal carbon allocation: Cap and share. A Report to Comhar SDC Sustainable Development Council, Ireland, AEA Energy & Environment and Cambridge Econometrics)	We discussed in the text some of this, but unfortunately we can't expand more on this for space restrictions.
22233	15	23	18	23	21	Another example is the tradable fish quota in New Zealand.	We restrict attention to air pollution schemes but Tietenberg (2006) covers that as well.
22234	15	23	23	23	23	Could also be added: Chile, Kazakhstan	Chile has not implemented a carbon market, yet.
28142	15	23	24	23	24	Please add "/provinces" after "different cities".	Incorporated
38655	15	23	25	23	26	Brief equates to non-comprehensive? Is not the IPCC supposed to complete a comprehensive assessment? Explain why it's not provided here.	Brief doesn't equates non-comprehensive. We covered the most important topics and leave the details to references
31263	15	23	33			The report should present the data on CO2 prices over time in various markets (ETS, CDM, voluntary, New Zealand, RGGI) and assess the lessons from experience.	Space limitations prevent us to go deeper into this.
32297	15	23	33	24	30	The acceptance or readiness to cap and trade very much depend on the amount of allocations and how allocations are made. So far, only socially acceptable level of cap and trade systems are in place (in other words, allocation is lax) and it does not follow that they will work effectively in the future if stringent reduction target is sought.	We agreed with this and is somewhat mentioned in line 39 of p. 23
38656	15	23	34	23	40	Is not the IPCC supposed to be a comprehensive assessment of the literature? Does the literature evaluate the effectiveness of emissions trading programs? Tietenberg ref is pre-AR4. Has there been nothing on the matter done since AR4?	For ETS other than carbon ETS Tietenberg (2006) is as comprehensive as one can find.
24481	15	23	37	23	39	It can't be said that "emissions trading, when implemented, has worked reasonably well at least from the viewpoint of ex post environmental and economic effectiveness perspectives", because of the fact that EU-ETS system has collapsed by price sudden fall.	Accepted. Chapter 14, Section 14.4.2 provides a balanced analysis of the EU ETS and discusses the reasons for the price collapse.
24146	15	23	37	23	29	This is wrong analysis! So, delete "well"in the sentence since GHG reductions in Europe dose not result mainly from introduction of ETS but a shrinkage of European market due to Lehman shock or European finance crisis.	Accepted. Chapter 14, Section 14.4.2 provides a balanced analysis of the EU ETS including the role of the financial crisis.
19756	15	23	37	23	39	This is not necessarily true. In EU-ETS, where carbon price is cllapsed, power sector burn more and more coal, emitting CO2, since coal with emission cirtificates is cheeper than Gas or nuclear. Cap&Trade scheme only achieve predetermined cap level emission. Even if the emission cheaply declines to lower than the cap because of the economic recession or any other reason, extra burning of cheep coal will fill the gap. This is what is really happening in Germany. See attached article: http://www.spiegel.de/international/europe/european-co2-emissions-reduction-system-is-broken-a-892134.html	Noted. Chapter 14, Section 14.4.2 provides a balanced analysis of the EU ETS including the role of the financial crisis and the allocation of allowances.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24437	15	23	37	23	39	I doubt the point "emissions trading, when implemented, has worked reasonably well at least from the viewpoint of ex post environmental and economic effectiveness perspectives" because this statement does not take into account of the impact of the current economic downturn incurred by the euro-zone crisis.	Accepted. Chapter 14, Section 14.4.2 provides a balanced analysis of the EU ETS including the role of the financial crisis.
22235	15	23	39	23	39	This seems like a rather old reference. Think that Ellerman has published more recent work on this: http://books.google.be/books/about/Pricing_Carbon.html?id=pigVprvX56QC&redir_esc=y	Accepted. Updated references have been included.
28143	15	23	39	23	39	Please add after "(Tietenberg 2006)": "As there is an emission cap, the emissions target will be achieved. With “banking” or “borrowing”, flexibility in the effective target path according to different mitigation costs at different points in time can be achieved. Finally, the cap can in principle be directly derived from science-based climate goals, commitments in international treaties, and/or milestones in roadmaps such as the EU 2050 Roadmap, which can assist in getting support for stringent caps over time. Nonetheless, another..."	Not incorporated because we will have to elaborate much further on the cap setting process.
22396	15	23		25		The text here provides an uncritical acceptance of the concept of emissions trading. However, both the concept and practice of emissions trading has been critiqued substantively. There should also be text that indicates that there are critiques to emissions trading. Such text could be as follows: "However, it should be noted that both the theory and practice of emissions trading and carbon markets as applied to mitigation have also been viewed critically and with caution both academically and, in the context of the UNFCCC negotiations, politically." For published academic critiques, see, e.g., Larry Lohmann, Carbon Trading, Climate Justice and the Production of Ignorance: Ten examples, Development (2008) 51, pp. 359–365; Michael Hopkin, Emissions trading: The carbon game, Nature 432, 268-270 (18 November 2004); Heather Lovell et al., Carbon Offsetting: Sustaining Consumption?, Environment and Planning A 2009, volume 41, pages 2357-2379, at http://sciencepolicy.colorado.edu/students/envs_4100/lovell_2009.pdf; Steffen Bohm and Siddhartha Dabhi (eds), Upsetting the Offset: The Political Economy of Carbon Markets (MayFlyBooks, 2009), at http://www.libros.metabiblioteca.org/bitstream/001/314/8/978-1-906948-07-8.pdf. For political critiques in the context of the UNFCCC negotiations, see, e.g. Bolivia, at http://unfccc.int/files/bodies/awg-lca/application/pdf/20120518_bolivia_nmm_2100.pdf and at http://unfccc.int/resource/docs/2012/awglca15/eng/misc06a02.pdf; and Philippines on behalf of a group of like-minded developing countries, stating that "Another important lesson to take stock of is the current collapse of the carbon markets. In this light, the effectiveness, viability and environmental integrity of market mechanisms for mitigation need to be reviewed and considered with caution, especially proposals for their expansion", at page 8 of their submission (http://unfccc.int/files/documentation/submissions_from_parties/adp/application/pdf/adp_lmdc_workstream_1_201 30313.pdf).	Not addressed
24203	15	23	24	23	24	change the phrase "different cities in China" into "different provinces and cities in China", for in China, there are 7 ETS Pilots includes 2 provinces and 5 cities.	Incorporated
19985	15	23	24	23	24	change the phrase "different cities in China" into "different provinces and cities in China", for in China, there are 7 ETS Pilots includes 2 provinces and 5 cities.	Incorporated

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32225	15	23	37	23	39	The claim is made that 'emissions trading, when implemented, has worked reasonably well at least from the viewpoint of ex post environmental and economic effectiveness perspectives'. However, this is based on a 2006 article published before any of the major emissions trading schemes had been operating for long enough to have reliable evidence of their effectiveness against either of these criteria. A more evidence-based conclusion would be that: 'Most of the emissions trading scheme introduced around the world are too new for their environmental, economic or distributional effectiveness to be evaluated. However, studies of the EU emissions trading scheme, the world's largest and most longstanding trading scheme, indicate that its inability to adjust to radically shifted wider economic conditions, in the shape of the financial crisis, threatens to undermine its efficacy in providing incentives for abatement. The reference for this statement is: http://www2.lse.ac.uk/GranthamInstitute/publications/WorkingPapers/Papers/100-109/WP106-effectiveness-eu-emissions-trading-system.pdf. Further evidence indicates that political difficulties in setting sufficiently strict emissions caps for the EU ETS has hindered its ability to produce significant deviations from business-as-usual emissions. Supporting references for this second statement are: Bailey, I. and Maresh, S. 2009 Scales and networks of neoliberal climate governance: regulation, industry non-state actors and the implementation of the European Union emissions trading scheme Transactions of the Institute of British Geographers, 34 (4), 445-461; Venmans, F. (2012) A literature-based multi-criteria evaluation of the EU ETS, Renewable and Sustainable Energy Reviews, 16 (8): 5493–5510. The point is further underscored by the EU's current difficulties in gaining acceptance for proposals for backloading to counter the current glut of allowances in the EU ETS.	Accepted, text has been revised. Chapter 14, Section 14.4.2 provides a balanced analysis of the environmental and economic effectiveness of the EU ETS, taking its structural problems, including the difficulty of responding to the financial crisis, into account.
25788	15	23				This section should be deleted completely. The introduction of tradable allowance programs for SOx/NOx in the US is based on different background. Conditions of GHG case are different from those of SOx/NOx case, as described in (Wakabayashi, 2007, page40, only Japanse). These literature is listed in the No154 line of this table.	Disagree. Evidence from ETS other than carbon still provide lessons for carbon market design. The section is maintained.
38658	15	24	20	24	21	There is a large literature on evaluation of national/subnational emissions trading policies. The authors fail to provide depth/breadth of the literature..	No details are provided to address this comment
33083	15	24	23			This is a useful reference to Chapter 14. It would be made even more useful if a one sentence summary could be pulled from their text, summarizing whether or not the Eu ETS was found to have cost savings.	We can pull that sentence after Ch 14 has provided one.
28144	15	24	23	24	23	Cost savings for the EU ETS are not documented in Chapter 14	Accepted, text has been amended.
24949	15	24	28	24	28	Inconsistent - says that a key component in ETS is establishing the gases covered. However, there is minimal discussion of coverage of gases in different ETS in this section. Suggest adding in outline of gases covered in Australia and California - refer to section 7A of the National Greenhouse and Energy Reporting Act 2007 (Australia- http://www.comlaw.gov.au/Details/C2007A00175) and the Californian legislation.	We have added a footnote with the reference.
38657	15	24	3	24	4	The text here references an old source. The authors should find more recent literature or remove.	This has been removed
24950	15	24	30	34	31	The availability of emissions data does not determine coverage settings, as reporting requirements can be built into the system. Suggest replacing with"…as the evidence below shows: the quality and cost of emissions measurement and verification, targeting sectors..."	Incorporated
24951	15	24	42	24	43	The estimate of around 500 emitters is an earlier estimate from 2011. The best current estimate is 360. Citation: http://www.cleanenergyregulator.gov.au/Carbon-Pricing-Mechanism/Liable-Entities-Public-Information-Database/LEPID-for-2012-13-Financial-year/Pages/default.aspx	Incorporated

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24952	15	24	42	25	7	The section on coverage is not accurate. Please amend as follows (or similar): "Generally, natural gas use is covered by upstream liability on suppliers, who pass on their costs. An additional six per cent of Australia's emissions are covered by an equivalent carbon price. Liquid fuels used in aviation/shipping and for stationary energy purposes, and synthetic greenhouse gases are subject to an equivalent carbon price through changes to existing tax, excise and levy arrangements."	Incorporated
29566	15	24	42	25	5	It is my understanding that Australia has yet to implement carbon trading but is temporarily relying on a fixed carbon tax.	this is in the text
32226	15	24	1	24	2	An appropriate reference for the two statements on lax allocation or failure for programs to navigate parliamentary/political processes is: Passey, R., Bailey, I., Twomey, P. MacGill, I. 2012 The inevitability of 'flotilla policies' as complements or alternatives to emissions trading schemes, Energy Policy, 48 (1): 551-561. This article provides an overview and analysis of lax allocation in, the limited scope of, or failure of a number of national emissions trading schemes.	Partially incoporated (see comment No. 264)
32227	15	24	42	24	43	A footnote may need to be added to clarify that the Australian scheme is not yet functioning as a cap-and-trade scheme because of the prevailing fixed price for the period 2012-2014, though the same point is made at the bottom of p. 25, but in relation to caps rather than pricing approach. It is also worth noting that it may never reach of the stage of a floating fixed price if the current Australian opposition leader fulfils a pledge to repeal the measure if his coalition wins the next general election scheduled for August 2013.	This is explained in p. 25
22236	15	25	12	25	12	Replace "expected" with "intended" as in reality low prices are an incentive to harvest forests rather than conserve them.	Incorporated
28145	15	25	12	25	12	Please delete "agriculture and". NZ has postponed inclusion of the agricultural sector.	Incorporated
22237	15	25	22	25	30	Why hasn't the EU ETS been mentioned here? Perhaps because it's already been discussed in Ch.14?	that's the reason
38659	15	25	31	27	39	The section describes various approaches, which could be simply summarized in a table and does not, as anticipated evaluate the literature's view/analysis/evaluation of these approaches, even estimated costs/impacts.	dismissed.
28146	15	25	45	25	46	Please change "which does not need to be in terms of costs if abatement possibilities are more limited" to "which can be explained by higher short-term mitigation costs for deeper emission reductions and consequent lower target paths"	Incorporated
24953	15	25	48	26	1	The discussion of the political circumstances behind the fixed price period perhaps oversimplifies things. Suggest add the following sentence after line 1 on p26: "The fixed price period also quickly established a price signal and provided time for important elements of the flexible price period to be implemented, such as an auction platform"	Incorporated
29248	15	26	12	26	12	The text states the New Zealand will be adding the agricultural and waste sectors to its ETS from 2013, but their government took a decision in November 2012 to indefinitely postpone the inclusion of agriculture.	Incorporated
28147	15	26	17	26	17	Incorporate planned cap-review in RGGI as an example for political intervention in a market triggered by unexpected low prices? http://www.rggi.org/docs/PressReleases/PR130207_ModelRule.pdf	Incorporated
22238	15	26	20	26	22	Would be good to define the three terms here. Is "output allocation" a synonym for "benchmarking"? If not, then the latter should also be included.	dismissed to avoid confusion
28148	15	26	20	26	29	To increase the preciseness of this paragraph, we propose the following changes "There are several ways in which permits are allocated to affected sources: free through grandfathering, benchmarking or output allocation, and auctioning. Earlier programs relied almost exclusively on grandfathering. The EU-ETS started mainly with grandfathering as dominating allocation method in the first trading period, moving to some benchmarking and auctioning in the second trading period and introducing auctioning as the main allocation method during the third trading period but with a considerable share of permits allocated to trade-exposed industries by benchmarking. "	Accepted, Chapter 14, Section 14.4.2 provides this detail about allowance allocations.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
28149	15	26	22	26	24	This is not very relevant and could be deleted.	dismissed because it's important to illustrate how allocations have been moving away form 100% grandathering
28150	15	26	25	26	29	To increase the preciseness of this paragraph, we propose the following changes "Australia and California also introduce auctioning as the “leading” allocation method, with temporary free allocation according to benchmarking for trade-exposed industries (differentiated according to perceived degree of exposure). In fact, the programs in New Zealand and Australia consider a very limited amount of auctioning (although increasing over time) unlike RGGI which allocates everything through auctions (the softer cap in RGGI explains large part of the difference). California is somewhere in the middle in terms of auctioning."	Incorporated
22609	15	26	27			RGGI does not allocate "everything" by auctioning, but "the vast majority". One study says 90% (Zetterberg, Lars et al. "Short-run allocation of emissions allowances and long-term goals for climate policy." Ambio 41.1 (2012): 23-32.). In the first control period (2009-11), 90% of the total amount of allowances was either offered at auction or sold at fixed price (http://www.rggi.org/market/co2_auctions/allowance_allocation) but not all that was offered was bought.	incorporated
28151	15	26	30	26	31	To increase preciseness we propose the following changes "The Californian and Australian scheme are also interesting because they make explicit output-based (free) allocation rules for energy-intensive, trade-exposed sectors, where recent production determines firm-level allocation"	noted.
24955	15	26	31	26	33	Incorrect - free allocation in the Australian scheme is provided in the form of permits. Please amend.	Incoporated (see comment No. 305)
28152	15	26	31	26	33	We suggest deleting this sentence, because there are output-based allocations, but no transfer payments in Australia. Companies who receive a free (output-based) allocation, can use them for compliance, transfer them to other Australian registry accounts or (but only during the fixed price period) sell them to the Clean Energy Regulator (Buy-back).	Incoporated
32298	15	26	37	27	9	It should be discussed how rigorous compatibility is needed to link different systems or what are flexibilities in linking systems.	It is already discussed for some, but not all, of the linking proposals. As we explain in the text, it is not much else we can say because we don't have empirical evidence on this
28153	15	26	39	26	40	"It is similar to allowing for offsets from domestic uncapped sectors" - this does not seem to be a suitable comparison. Linking: cap - cap = new total cap. Offset of uncapped sectors: Cap - no cap = no total cap.	The sentence has been deleted to avoid confusion.
24956	15	26	40	26	41	Understates the benefits of linking. Suggest adding: "Linking ETS also improves market liquidity and strengthens international cooperation on climate change."	Incorporated
22239	15	26	40	26	43	Linking also increases the market liquidity and reduces price volatility, and creates a more level playing field between operators in different systems.	Incorporated
28154	15	26	43	26	43	Please delete "in addition"	Incorporated
20453	15	26	19	26	36	Discussion would benefit from reference to ethical considerations involved in choosing between different allocations, as discussed by Hyams, K. (2009) A just response to climate change: personal carbon allowances and the normal functioning approach. Journal of Social Philosophy, 40 (2). pp. 237-256. ISSN 0047-2786 doi: 10.1111/j.1467-9833.2009.01449.x	We don't have scientific evidence to enter into such discussion.
29567	15	26	19	26	36	Given the importance of the EU ETS as the biggest cap-and-trade scheme in the world, it seems appropriate to include a description of its allocation mechanism and how it has/will be changed over the years given the experiences to date.	Accepted, Chapter 14, Section 14.4.2 provides this detail about allowance allocations.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24954	15	26	25	26	29	The statements about the extent of auctioning in Australia, New Zealand and California are incorrect. It is anticipated that around half of allowances in Australia will be auctioned. New Zealand's legislation provides for regulations for how auctions would work, but these regulations have not been made and New Zealand does not auction any allowances. California auctions around 85% of allowances but these are mainly double-sided auctions, where some regulated entities who have already been allocated units offer them at the auction - the portion of units offered by the Government/CARB at auction is much smaller. Suggest at minimum, remove Australia from this sentence (further delineate New Zealand and California as above if possible)	Incorporated
28155	15	27	1	27	6	To increase preciseness, we propose the following changes: "One example of a linking process is the ongoing collaboration, since 2007, between California and the Canadian province of Quebec, which will both place compliance obligations on large emitters under their trading schemes beginning in January 2013 (CARB, 2011, p 201) and continue negotiations for a full linking of the two schemes later on in 2013. Another example is in Australia's last year the joint announcement of Australia and the EU to link their systems in 2018 with an interim link that it was linking its system to the EU ETS to start trading allowing Australian installations to use EU-Allowances for compliance from 2015 on."	this change in the text has been incorporated.
38660	15	27	11	27	11	The caveat as "briefly" vs comprehensive assessment of the literature does not fulfill the requirement of the IPCC assessment process. Revise/expand scope of literature covered	JPM: There are space contraints we have to work with.
28156	15	27	17	27	17	Please delete or specify "linking of schemes"	noted
22240	15	27	22	27	23	Additionality can still be an issue with sectoral crediting, but instead of determining additionality for each project, this is now done when setting the ex-ante sectoral baseline and the (possibly lower) crediting threshold. Gettign these wrong can also lead to non-additional credits.	noted
22241	15	27	24	27	25	On the other hand, leakage concerns could appear when operators purchase offsets from competing industries in uncapped markets. Such concerns were documented for CDM projects from adipic acid production. See http://www.sei-international.org/news-and-media/1883.	noted
28157	15	27	25	27	27	To increase preciseness of the sentence, we suggest the following changes: "However, since in principle future allocations should not be influenced by a firm's current behavior , the design of an output-based allocation must balance these distortions in output with the control of leakage."	Noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
19137	15	27	28		35	The statement "price volatility and market power have also been present in the discussion of permit trading."" understates both the evidence and the importance of price volatility. Experience not only validates the concern that emissions trading can be plagued by volatile prices, but it also demonstrates that price volatility is not a rare event. The EU-ETS, RECLAIM, and the sulfur allowance program have all experienced events where prices became quite volatile. • In the EU-ETS case two early declines were attributable to two correctable design mistakes (inadequate public knowledge of actual emissions relative to the cap and a failure to allow allowances in the first phase to be banked for use in the second phase). (Ellerman, 2008) A subsequent decline, in 2012, when carbon prices declined to record lows due to a surplus of permits relative to demand, stemmed from an over-allocation of permits, recession, and long-term uncertainty about climate policy. • The Regional Clean Air Incentives Market (RECLAIM) in the Greater Los Angeles area experienced substantial price spikes due to an unanticipated rise in the demand for allowances. This rather dramatic demand shift resulted from the unexpected unavailability of important low or non-polluting electrical generating sources (natural gas and hydro from out-of-state). The effects were intensified by the fact that at precisely the same time the program was reaching the 'crossover' point, the first time that actual emissions would exceed allocations unless emission reduction controls were installed at facilities. (SCAQMD, 2007) • In the U.S. sulfur-emissions trading program prices became volatile in the 2004-2005 and 2008-9 periods. In the first period a large rise in allowance prices was triggered by a rapid rise in natural gas prices (due in part to Hurricane Katrina), while in the second period prices fell dramatically in response to two U. S. Circuit Court rulings dealing with a different, but related program to control sulfur (Clean Air Interstate Rule). (Burtraw and Szambelan , 2009) This language is from Tietenberg, T.H. (forthcoming-Summer, 2013)" Reflections-Carbon Pricing in Practice" Review of Environmental Economics and Policy. The cites for the references in the above are: Ellerman . A Denny. 2008. "Lessons for The United States from The European Union's CO2 Emissions Trading Scheme In Cap-And-Trade: Contributions To The Design Of A U.S. Greenhouse Gas Program by A. Denny Ellerman, Mort D. Webster, John Parsons, Henry D. Jacoby and Meghan Mcguinness (Cambridge, MA: MIT Center for Energy and Environmental Policy Research): 2-35. Available On The Web At: http://Web.Mit.Edu/Ceepr/Www/Publications/Ddcf.Pdf; South Coast Air Quality Management District (SCAQMD). 2007. "Over a Dozen Years Of RECLAIM Implementation: Key Lessons Learned In California's First Air Pollution Cap-and-Trade Program" Available on the web at: http://www.aqmd.gov/reclaim/reclaim_annurpt.htm: and Burtraw, Dallas and Sarah Jo Szambelan .2009. "U.S. Emissions Trading Markets for SO2 and NOx Washington, DC: Resources for the Future Discussion Paper 09-40. Available on the web at: www.rff.org/documents/RFF-DP-09-40.pdf.	noted
24958	15	27	33	27	35	The transition to a floating price has always been part of the Australian scheme design - the fixed price has not been "abandoned". There will also not be a price floor in the floating price period. Suggest replacing with "In 2015, the Australian scheme will transition from a fixed price to a floating price set by the market, with a pre-defined price ceiling from July 2015 to July 2018"	noted- revised.
28158	15	27	33	27	33	Please add the following sentence after "Recent carbon schemes are more responsive to it": ", e.g. the California system with its combination of a minimum price (reserve price) and a so-called allowance price containment reserve, which sets aside a certain percentage of the total allowance budget for feeding the reserve and offers the reserve amounts (thus enlarging supply) when certain price limits are reached." We think that California is a better example for ETS-design-features to combat volatility of prices than Australia.	noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
28159	15	27	33	27	35	Please delete the following sentences: "Australia is a good example. In 2015, the Australian scheme will abandon its fixed price and move to a true trading scheme but with a pre-defined price band (Jotzo and Betz, 2009; Jotzo and Hatfield-Dodds, 2011)." Minimum price and price cap in Australia were intended to exist only during the first three flexible price years (2015 - 2018). Australia abandoned the minimum price after the linking-announcement with the EU. Laws have been changed in December 2012. We think that California is a better example for ETS-design-features to combat volatility of prices than Australia.	noted
21412	15	27	40	31	28	This part on regulation and information measure needs revision using other chapters findings (ch1-12). A comprehensive discussion is required for the role of regulatory approach (not always barrier removal but it is used for R&D and for carbon pricing implicitly), issue of negative costs need discussion with hidden cost issue and rebound effect.	accepted text modified
20369	15	27	40	28	21	the main results of the literature on the energy label shoud be presented somwhere in the chap. The EU energy label has been considered as one instance of successful instrument, also its recent revision has been debated in the literature. recent ref : Stefanie Lena Heinzle, Rolf Wüstenhagen 2012 Dynamic Adjustment of Eco-labeling Schemes and Consumer Choice – the Revision of the EU Energy Label as a Missed Opportunity?Business Strategy and the Environment Volume 21, Issue 1, pages 60–70, January 2012	accepted. It is covered In ch9 mainly and we make reference to it
38661	15	27	40	28	22	The authors' use of EE to bundle a variety of policy approaches is inappropriate. The literature separates regulated emissions, from standards , etc, all of which may impact the "energy efficiency" of e.g. cars, refrigerators, A/C, lighting, vs emissions from a generator, refinery etc...	accepted text modified
40765	15	27	40	31	28	This part on regulation and information measure needs revision using other chapters findings (ch1-12). A comprehensive discussion is required for the role of regulatory approach (not always barrier removal but it is used for R&D and for carbon pricing implicitely), issue of negative costs need discussion with hidden cost issue and rebound effect.	accepted text modified
29249	15	27	5	27	5	Line 5 on EU ETS - Australia linking slightly mispresents the truth. The announcement last year was about a one way link from the Australian system to the EU ETS from 2015, so this needs to be made clear so it cannot be read as two way linking.	noted
24957	15	27	6	27	7	While Australia has co-operative relationships with both South Korea and California, and is keen to share its experiences in developing an ETS with those jurisdictions, no "explorations of ways to establish links" have occurred. No announcement on linking with NZ ETS has been announced. The only country or region with which we are progressing linking is the European Union. Suggest deleting the sentence, reference and footnote.	noted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32228	15	27	10	27	39	The design issues discussed in this section are generally appropriate. However, the specific design and governance challenges associated with controlling market power and fraud prevention and detection are not mentioned in detail. It would be useful to note that market power (sometimes in association with lax emissions caps) have caused some problems of windfall profits in and gaming of the EU emissions trading scheme. Evidence of this is discussed in Bailey, I. and Maresh, S. 2009 Scales and networks of neoliberal climate governance: regulation, industry non-state actors and the implementation of the European Union emissions trading scheme Transactions of the Institute of British Geographers, 34 (4), 445-461. Those associated with fraudulent practices (e.g. carousel VAT fraud) are assessed in Berrittella, M. and Cimino, FA (2012) The Carousel Value-Added Tax Fraud in the European Emission Trading System, FEEM Working Paper No. 75.2012, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2175482## . The need to mention these as design considerations is reinforced by the temporary suspension of the EU scheme in early 2011 following significant breaches in the security of on-line national registries, the crucial point here being the importance of market confidence to the operation of emissions trading schemes, and, thus, to have adequate fraud detection systems. The issue of establishing governance structures that are able to prevent or control potential fraud in emissions trading schemes resulting from international revenue and permit flows might also be mentioned on p. 48, towards the end of the paragraph lines 3-10, though it generally seems to fit better where first suggested.	References to EU-ETS should be incoporated in Ch 14, not here.
32980	15	27				Much of what appears in this section is already covered in the sectoral policies section of Chapter 9 (Buildings). Please remove overlaps. It would be much more useful to the reader to discuss overarching regulations that apply to each sector respectivelysuch as performance standards, building codes and mandated technologies including the pluses and minuses of each. Moreover, it would be important to highlight that while c-pricing policies are broadly discussed as optimal instruments in the literature, regulations are much more commonly applied in the real world.	Dismissed. Perfomance standards are discussed somewhere else. Important to keep here the discussion about other design issues (and it's quite brief)
38662	15	28	11	28	11	The text uses an old reference here. It only discusses consumers vs other end users (e.g. corporations, others…). The authors should expand the text to cover broader range of policies.	taken into account. It is combined in ch3
28160	15	28	12		17	Argumentation not clear: are "high-quality" goods assumed to be also "energy efficient"? If yes, this should be mentioned and explained in one or two sentences	taken into account. It is combined in ch3
28161	15	28	18		21	What is the sellers incentive to offer less energy efficient products? Especially since energy efficient (high quality goods) are usually more expensive.	accepted text modified
38663	15	28	26	39	48	This section is too RE centric and should be more balanced to cover lower GHG techs/solutions, including CCS/EOR, EE, even nuclear. Also, th references are old in many areas	noted
28162	15	28	38	28	47	There are certainly better examples with more convincing outcome for the impact of building codes on energy consumption than the US. European countries like Sweden, Denmark, Germany, and the EU as a whole have introduced more and more aggressive building codes. Suggestion to look for these examples.	taken into account. It is combined in ch9
19986	15	29	34			"have found" have been repeatedly typed here.	accepted
26272	15	3	10	4	11	15.5.7.4 Voluntary agreements as a major policy instrument in governmental mitigation plans could be shortened to 15.5.7.4 Voluntary agreements as a major policy instrument	Noted- it has been shortened.
26273	15	3	33	3	34	15.8.3 Summary concerning policies for abatement and new technology including linkages and interactions between policies (15.5 – 15.8) could be shortened to 15.8.3 New technology including linkages and interactions between policies	This section has been rewritten.
33084	15	30	10	30	21	The discussion of policy packages is oddly placed here. It would be much more appropriate for this discussion to appear in Section 15.7.	accepted text modified
38664	15	30	16	30	21	Revise the literature cited here; there is a rich literature that should be reflected.	accepted text modified

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
29535	15	30	22			The idea that many studies find over 100% total macroeconomic rebound gives these studies far too much credibility. These are highly controversial results.	taken into account. It is combined in ch5
27032	15	30	27	30	33	The taxonomy of rebound effects here is inaccurate. The first effect listed is traditionally referred to as "direct rebound," while the second is referred to as "indirect." The latter two effects are referred to as "macro-economic" or "economy-wide" effects. See taxonomy in IRGC 2013 or Jenkins et al. 2011 (both cited above).	taken into account. It is combined in ch5
26757	15	30	27	30	33	It is uncommon to divide the rebound effect into four, ususally there is a direct rebound effect and an indirect that is subdivided into two.	taken into account. It is combined in ch5
28163	15	30	27	30	33	This description of the different rebound effects is very clear. It should be included when rebound effects are first mentioned (I believe in chapter 5).	taken into account. It is combined in ch5
29328	15	30	34	30	41	The original peer-reviewed papers upon which these estimates were drawn: Lorna Greening, David L. Greene and Carmen Difiglio. Energy efficiency and consumption -- the reboundeffect -- a survey. Energy Policy, 28(6-7): 389-401. 2000; Dimitropoulos, John, "Energy productivity improvements and the rebound effect: An overview of the state of knowledge," Energy Policy, 35 (12): 6354-6363. 2007. Steve Sorrell. Jevons Paradox revisited: The evidence for backfire from improved energy efficiency, Energy Policy, 37(4): 1456-1469. 2009.	taken into account. It is combined in ch5
27033	15	30	34	30	41	In addition to Jenkins et al. 2011, the following should be cited in reference to rebounds in developing economies (see note for Chapter 5, Page 51, Lines 10-30 above for discussion):: Davis, L., Fuchs, A. and Gertler, P., Cash for Coolers, National Bureau of Economic Research Working Paper no. 18044.; Lee, C.-C. and Lee, J.-D., “A panel data analysis of the demand for total energy and electricity in OECD countries”, The Energy Journal, 31, 1, 1–24.; Fouquet, R., “Trends in income and price elasticities of transport demand (1850–2010)”, Energy Policy Special Issue on Past and Prospective Energy Transitions, 50, 62–71.; . Joyashree Roy. The rebound effect: some empirical evidence from India, Energy Policy, 28(6-7): 433-438. 2000.; Wang, H., Zhou, P. and Zhou, D.Q., “An empirical study of the direct rebound effect for passenger transport in urban China”, Energy Economics, vol. 34, 452–460.; E.O. Zein-Elabdin. "Improved stoves in Sub-Saharan Africa: the case of the Sudan," Energy Economics, 19(4): 465-475. 1997.	taken into account. It is combined in ch5
27034	15	30	34	30	41	In addition to Jenkins et al. 2011, the following should be cited in reference to rebounds in productive sectors (see note for Chapter 5, Page 51, Lines 13 above for discussion): Saunders, Harry D. "Historical evidence for energy efficiency rebound in 30 US sectors and a toolkit for rebound analysis," Technological Forecasting and Social Change, In Press (2013) available online 11 January 2013 at http://dx.doi.org/10.1016/j.techfore.2012.12.007; Lorna Greening, David L. Greene and Carmen Difiglio. Energy efficiency and consumption -- the reboundeffect -- a survey. Energy Policy, 28(6-7): 389-401. 2000; James J. Winebrake et al. "Estimating the direct rebound effect for on-road freight transportation," Energy Policy, 48: 252-259.	taken into account. It is combined in ch5
27035	15	30	42	30	43	Barker et al. (2007) actually find total indirect and macroeconomic rebound effects of 11 percent for a set of policies designed to encourage energy efficiency in residential housing in the UK. This combines with an estimated direct rebound effect of 15 percent to yield a total economy-wide rebound effect of 25 percent. Note that this study is national in scope, and so does not encompass any global macro-economic effects (e.g. shifts in import/export patterns and associated energy use). See discussion in Jenkins et al. (2011), page 35-39.	taken into account. It is combined in ch5

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
27036	15	30	42	31	2	This paragraph should also cite Barker et al. (2009) uses a similar method as Barker et al. (2007) to examine macroeconomic rebound effects at a global scale (one of the few such studies to examine a global scope, which is particularly relevant to global climate mitigation efforts). For energy efficiency measures undertaken globally in the period 2013-2020, Barker et al. (2009) estimate that total economy-wide rebound erodes 31% of the projected energy savings potential by 2020, with rebound rising to 52% by 2030, averaged across the global economy. Citation: Terry Barker, Athanasios Dagoumas, and Jonathan Rubin. The macroeconomic rebound effect and the world economy, Energy Efficiency, 2(4): 411-427. 2009.	taken into account. It is combined in ch5
32299	15	30	43	30	44	The rebound effect studied by Mizobuchi appears misleading as 37% is unusually high. This is not the result of factual investigation but a simulation. Therefore, the assumptions behind the simulation need to be scrutinized and more close to reality analysis should be introduced rather than this extreme case.	taken into account. It is combined in ch5
19757	15	30	34	31	19	Rebound effects occur as a result of higher energy usage because of relatively cheeper energy cost brought by energy saving (or efficiency improvement). At the same time, rebound effects also bring higher economic growth (=higher energy usage). In other words, rebound effects are necessary side-effects of faster economic growth as the results of efficiency improvement.This is in line with Sustainable Development goals stated from page 8 line 16-page 9 line 3. Therefore, following phrase should be inserted here: Even though rebound effects discount the net effects of energy savings, it brings higher economic welfare to the people who achieve those. It only accelarate the economic growth, which whould have been anyway achieved a few years later. In this context, line 13-14 in page 31 is a fair expanation and should be kept.	taken into account. It is combined in ch5
39160	15	30	42	31	19	There are several problems with this section that ought to be addressed: 1) the 10-30% for direct rebound only applies only to a subset of end-uses, but the text implies that it is a general phenomenon; 2) the ill-defined concept of "productive sectors of the economy" implies that this is a large and important phenomenon that is well substantiated in the literature - which it is not; 3) There's really no evidence for an effect as large as this (even the macro modelers seem to agree on this) and, as such, it does not deserve such prominence in such an important document; 4) The distinction between developed and developing economies is an important one, but the discussion lacks important context about where rebound might be a problem and where it isn't. One article to consider including would be Gillingham, Kenneth, Matthew J. Kotchen, David S. Rapson, and Gernot Wagner. 2013. "Energy policy: The rebound effect is overplayed." Nature. vol. 493, no. 7433. 01/24/print. pp. 475-476. [http://dx.doi.org/10.1038/493475a]	taken into account. It is combined in ch5
27031	15	30	22			This section should be made as consistent as possible with Chapter 5, Section 6.2, which also surveys rebound effect literature See comments and recommended citations above on that chapter, which can apply here as well. Readers should get a consistent treatment of the literature in both of these sections to avoid confusion.	taken into account. It is combined in ch5
27037	15	31	10	31	12	This should say "...to a high of 60 percent or greater in some circumstances…" 60 percent is in no way an upper bound on the range of rebound effects found in the range of literature examining rebound. See comments above. 10-60 percent may be a typical range for many cases, but it is no way inclusive of the full range, which can extend up to 100 percent or above in certain cases.	taken into account. It is combined in ch5
28164	15	31	18		19	Here, it might fit to add another sentence that underlines the potential of an appropriately high carbon price to reduce leakage as mentioned in the last sentence of this paragraph.	taken into account. It is combined in ch5

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
20370	15	31	20	32	28	the main results of the literature on the energy label shoud be presented somwhere in the chap. The EU energy label has been considered as one instance of successful instrument, also its recent revision has been debated in the literature. recent ref : Stefanie Lena Heinzle, Rolf Wüstenhagen 2012 Dynamic Adjustment of Eco-labeling Schemes and Consumer Choice – the Revision of the EU Energy Label as a Missed Opportunity?Business Strategy and the Environment Volume 21, Issue 1, pages 60–70, January 2012	taken into account. It is combined in ch9
26600	15	31	28			ADD/ Zélem (Marie-Christine (2010). Politique de maîtrise de la demande d'énergie et résistance au changement, une approche socio-anthropologique. Paris: L'Harmattan). in her sociological studies on energy behaviours at home demonstrates how information by itself does not suffice to create permanent changes in behaviours linked to energy uses. Indeed, the information is forgotten as soon as daily habits and routines kick back in an automatic unconscious manner. She also shows the complexity of the relationship between an energy technology and its use by actors: an actor's capacity at integrating new technologies associated to energy uses depend on several factors beside the technology itself, such as information on energy efficiency, motivations for use (interest in technologies, ecological values or financial considerations), which are themselves linked to childhood, family status or socioprofessional categories, revenue levels, and institutional framework. Thus, informing potential consumers by itself does not suffice to create new behaviors.	Noted, but the author team do not have enough capacity to assess literature in French.
38665	15	31	30	31	34	As stated, this statement is an assertion; the authors should add literature references. No description of data or literature to prove assertion that these policies have led to reduced GHGs?	noted.
38666	15	31	30	32	19	The first 3 paragraphs of this section have no literature cited. What about FEMP, DOD or other Gov't initiatives across the world?	noted.
29568	15	31	20	31	28	Even if the literature is rather scarce, the evaluation of information measures seems rather vague.	accepted. Text modified.
22469	15	31	29			It should be pointed out here that government provision may also be necessary where firms fail to play the part assigned to them by public policy, for example where energy firms fail to take advantage of incentives to construct power stations equipped with CCS.	noted.
20371	15	32	11	32	12	the point supposed to be covered in 15.8 is not covered there.	noted.
20372	15	32	14	32	17	Local processes towards GHG mitigation have their own political logic which does not necessarily align with cost reduction. While logical to some extent, these considerations are very abstract. Can you provide any evidence of this in real situations ? Can you ground this assertion by a reference ?	noted.
26599	15	33				15.5.6 Government Provision of Public Goods or Services. In France, the EU's 20/20/20 objectives were adopted as national goals and then imposed throughout sub-national Territorial Climate and Energy Plans (adaptation is also an explicit sector), mandatory for any community or association of communities of over 50 000 people, from 2012. The means by which these objectives are to be reached are to be identified and implemented by the community. This form of imposition does not exist anywhere else in the EU. These plans are enshrined in Law according to Art. 75, of the Grenelle 2 Law (2012), within the framework of the National Environmental Code. All other territorial planning documents (land use, urban planning, mobility, construction, as well as air quality norms…) have to conform to the Climate and Energy Plan's objectives". This gives considerable influence to cities on issues and practices linked to building codes and construction, urbanism, vegetation, mobility, energy sources, typed and distribution, heating and cooling.., To be noted: only administrative institutions are constrained by these Plans. Other actors join on a voluntary basis. The French case, then, offers a legal framework that imposes objectives on public institutions which then gives rise to an institutional framework facilitating voluntary actions (cf,. section 15.5.7.5 Synthesis, p.35).	noted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38667	15	33	13	33	21	The text here needs to be revIsed and broadened. Include other EPA voluntary efforts, industry and NGO led efforts, etc.	accepted text modified
40766	15	33	10	33	11	The words “and corporate”should be added between “political”and “culture” Reason) On a judgment toward conclusion of voluntary agreements by corporate entities, the corporate culture of the country has the strongest influence among various kinds of cultural aspect.	accepted text modified
23127	15	34	1	34	5	Rezessy, S.; Bertoldi, P. (2011)'s results should be interpreted in a more balanced way. Their abstract says "Where there is a successful track record of cooperation between public authorities and the private sector, VAs can offer advantages to public authorities in comparison to legislation, most importantly better flexibility when introduced or updated, greater acceptance by industry, possibility for tailor-made solutions e.g. at the level of industrial sectors and opportunity to overcome the information asymmetry between public authorities and private actors. Nevertheless, VAs have been criticized for lack of specific obligations and lenient targets, as well as for deficiencies in compliance monitoring and self-reporting and difficulty in establishing the policy additionality of VA activity." The text should thus say that VAs can improve flexibility but are likely to have lenient targets and not be additional.	accepted text modified
35332	15	34	20	34	21	Since “Taiwan” is not a sovereign state, it is inappropriate to compare “Taiwan” with Japan. It is suggested to delete “Taiwan”.	accepted text modified
25102	15	34	31	34	31	After 2012), add the following sentence; "One characteristic of VAP is that the targets of each sector have been set rather stringent because Government has accurate information, through regulation, of energy and industry sectors' energy use and the yearly outcome of VAP is reviewed by Government committee (Yamaguchi (2012)". For reference; "Yamaguchi M. (2012). Policy and Measures. In: Climate Change Mitigation, A Balanced Approach to Climate Change. M. Yamaguchi, (ed.), Springer Publishing Company, London, UK pp.129–159 .	taken into account text modified

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
25933	15	34	32	34	36	I appreciate the IPCC's effort trying to ensure the balanced view on VAP, by adding the environmental NGO's analysis in this paragraph. Furthermore, I would suggest adding one sentence as follows, "In contrast, Kiko Network (2012), an environmental NGO, expressed critical view. They pointed out that targets are not ambitious and (enforcement mechanism is lacking in VAP), and VAP has not brought significant emission reductions above BAU levels." The reason for adding the sentence " VAP has not broguht significant emission reductions above BAU levels" is based on Kiko Network's new analysis released on November 2012 (citation below). 1) Keidanren's VAP uses indirect emssions, instead of direct emissions, which excludes emissions from industries that are not included in Keidanren, as well as emissions from households, and losses when generating electricity, which account for around 130 million tons CO2. Therefore Keidanren's report on achieving 9.6% CO2 reduction in 2010 compared to 1990 levels is not compatible with international standard IPCC guideline which uses direct emissions. When assessing the effectiveness of the VAP, the outcome must be analysed by international standard, namely by direct emissions data. When direct emissions data is used, Keidanren's VAP produced 10% more CO2 emissions compared to 1990 (excluding industrial process). 2) The industrial process sector has succeeded to reduce its emission by 31.8%. But when you want to assess the energy efficiency level of the manufacturers, you have to see the data without industrial process. As mentioned above, Keidanren's direct emission data shows 10% increase, whereas their indirect emissions data shows 6% reduction, both excluding industrial process. In the meantime, the IIP(Indices of Industrial Production) shows around 7% decline in 2010 compared to 1990 (perhaps due to economic crisis). Therefore their 6% reduction in indirect emissions data can be regarded as almost BAU decline. Therefore, adding the sentence of "(The environmental NGO states that) VAP has not brought significant emission reductions above BAU levels." can offer one aspect of the view from the internationally comparable perspective on assessing the VAP. citation: KIKO Network.2012. "Analysis on Japan Keidanren Voluntary Action Plan", http://www.kikonet.org/iken/kokunai/archive/iken20121115.pdf Supporting material of the view expressed above Japan Environmental Society. 2010. "report of GHG emissions evaluation committee", http://jaes.sakura.ne.jp/file/JAESGHG2009-main.pdf	Rejected. See comment 25789 for reason
32303	15	34	32	34	40	There have been real GHG emissions reduction achieved more than the level of aspirational targets at the outset. The Kiko Network does not try to recognize any voluntary actions by industry. Reference to Kiko Network does not seem appropriate as there is no peer reviewed reference.	accepted see comment 25789
24482	15	34	34	34	36	DELETE, as NGO's critical views are unsitable. And more, there is no concrete proof in the description that "targets are not ambitious and enforcement mechanisms are lacking in VAP"	accepted see comment 25789

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
19758	15	34	34	34	36	This is not true. Several industry sectors raised ambition levels with stricter target during the course of VAP, once they achieved original targets. In VAP period toward 2012, 23 sectors reised target level in 2007, 4 sectors raised in 2008, 5 sectors raised 2009, and 5 sectors raised in 2009. (Source: 2011nendo Kankyou Jisyukoudoukeikaku Daisansya Hyoukaiinkai Hyoukahoukokusyo, 2012.4.23 - The Third Party Verification Report on VAP 2011 http://www.keidanren.or.jp/policy/2012/029.pdf) Power and steel sectors purchased CDM credits paying billions of yen to keep the committed targets. They have explained those to the public and released in annual reports. This is clearly the evidence of the existance of strong self-enforcement mechanism. (Japan Iron and Steel Federation publicly reported that they have purchased 27million tons CO2 credits are a supplemental measure to comply with VAP target under Kyoto Protocol. See "Jisyu-koudou Keikaku 2011nendo jisseki-houkokusyo (2011 achievement report of VAP) at the following site: http://www.jisf.or.jp/business/ondanka/kouken/joukyo/ Therefore, the phrase "In contrast,...lacking in VAP." is groundless and should be removed.	accepted see comment 25789
25103	15	34	34	34	34	Could not find Kiko Network (2007) in reference. Please check.	taken into acccount see comment 25789
23128	15	34	6	34	6	Replace "other" by "the majority of", and add Baranzini and Thalmann (2004) to the list of references. Baranzini, A.; Thalmann, P. (2004): Voluntary approaches in climate policy, Edward Elgar, Cheltenham	taken into account text modified
32229	15	34	6	35	35	The discussion of voluntary agreements is generally satisfactory. However, one pertinent issue not mentioned in the final paragraph of 15.5.7.3 is the potential trade-off between creating more stringent requirements (higher and/or legally enforceable standards) and encouraging more widespread participation among target sectors. The evidence from some voluntary agreements such as the Greenhouse Challenge and GC Plus schemes in Australia is that weaker requirements may encourage more organisations to join voluntary programs but result in reduced effort by participating companies (Bailey, I. 2008 Industry environmental agreements and climate policy: learning by comparison, Journal of Environmental Policy and Planning 10 (2), 153-174). Weaker voluntary agreements can, of course, again help to ease political pressures by: i) giving the impression of government action while in reality not requiring businesses to go beyond business as usual; and ii) reduce business opposition to new climate initiatives compared with a tax or emissions trading system. The latter has the potential to produce greater long-term effects for the reasons outlined by Ekins and Etheridge (2006 and explained in the citation on p. 33) and by creating a system of agreements that can be made more stringent over time. Conversely, they lead to the 'lock in' of ineffective systems of climate governance by creating political precedents (see above reference Bailey, 2008).	accepted text modified
25789	15	34				The part from line34 to line36 should be deleted completely because there is no reference literature for "Kiko Network (2007)" and no specific rationale for Kiko Network's criticism. Each industry in Japan has voluntary target and the voluntary target scheme has played a big role, as described in (Yamaguchi, 2012, page35 and 154), (Manuel, 2010, page 6 and 13), and (Yamaguchi, 2010, abstract). These literatures are listed in the No22 line of this table. The other part of this section 15.5.7.4 should be kept in the final version report.	accepted text modified
33949	15	34	31	34	31	Add a refenrence Yamaguchi(2012) after the refenrece "Wakabayashi Masayo, 2012". Also add one refenece int the list of reference below. Yamaguchi M.(2012). Policies and Measures. In Climate Change Mitigation. A Balanced Approach to Climate Change. M.Yamaguchi.et.al. Springer Publishing Company, London, UK pp.129-159.	accepted text modified
35333	15	35	1	35	3	Since “Taiwan” is not a sovereign state, it is suggested to delete the example of Taiwan Province of China, i.e. to delete L1-L3, P35.	Noted.
38668	15	35	1	35	3	The text here needs to be revised to include the carbon disclosure project or other industrial /govt/PPP voluntary programs	accepted text modified

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
25104	15	35	10	35	10	Please add the following citation after 2012, " Yamaguchi (2012) For reference; "Yamaguchi M. (2012) Policy and Measures. In: Climate Change Mitigation, A Balanced Approach to Climate Change. M. Yamaguchi, (ed.), Springer Publishing Company, London, UK pp.129–159 .	accepted text modified
24483	15	35	11	35	13	Although it is described that several voluntary agreements have been criticized for not bringing about significant environmental impacts, there is no evivence. The reference of this description should be indicated. If the reference is not clerar, it should be deleted.	taken into account. Evidence shown in formar sections.
23131	15	35	27	35	35	Text is inconsistent. If VAs would harness the negative cost potential, the empirical evidence would show that they lead to significant reductions compared to baseline. As thi is not the case, and very few studies find reductions at all, it is clear that the negative cost potential is not harnessed by VAs.	Rejected. The comment is not valid.
38669	15	35	27	35	35	This is a controversial statement that only includes one reference (Akimoto). Other literature finds that some policy instruments may have significant impact. The authors should reivse the text accordingly.	taken into account. Text modified.
33085	15	35	3			"They found that the plan…was largely successful" - by what measure? Environmental effictiveness? Simply stating successfullness is an oversimplification here.	taken into account. Text modified.
19559	15	35	30	35	35	Would also suggest that voluntary programs provide an opportunity for "learning by doing" and sharing experiences.	accepted text modified
23614	15	35	34	35	34	The reference “Kiko Network (2007)” is not provided in the reference list. It should be provided or otherwise the sentence should be deleted.	accepted see comment 25789
38670	15	35	38			The fundamental factor that affects society's ability to mitigate carbon emissions are the price incentives facing individuals, businesses, and others. It is these incentives that may affect the development of new technology.	Agreed in part. This is more widely debated.
38671	15	35	38	35	39	Not only development, but also adoption/use/market uptake of technology.	Accepted, text has been amended
19759	15	35	5	35	7	In case of japanese VAP, several industry sectors raised ambition levels with stricter target in the course of VAP, once they achieved original targets. Therefore, one benefit of voluntary agreements is that it's flexibility and self setting nature of targets enable parties to raise target and ambition levels in due course of the program.	accepted text modified
33950	15	35	10	35	10	Add a refenrence Yamaguchi(2012) after the refenrece "Wakabayashi Masayo, 2012". Also add one refenece int the list of reference below. Yamaguchi M.(2012). Policies and Measures. In Climate Change Mitigation. A Balanced Approach to Climate Change. M.Yamaguchi.et.al. Springer Publishing Company, London, UK pp.129-159.	accepted text modified
32981	15	36				It may be useful to pull this figure into Section 15.3 to explain to the reader early in the chapter how technology policy fits together with those aimed at reducing GHG emissions.	Noted. Figure has been deleted.
28165	15	36	17		18	In addition, lock-in to existing renewable technologies might also be problematic, since innovation in new, potentially better technologies might be slowed down.	Noted. This portion of text no longer appears in the report.
29303	15	36	19			This figure loses more readers than the information it conveys. Recommend removing.	Accepted. Figure has been deleted
38672	15	36	19			This figure should be deleted as it adds little value and is confusing.	Accepted. Figure has been deleted
22855	15	37				the legend for the blue color is missing	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
32983	15	37				Please note that in order to conform to the WG III AR5 standard, the units here will need to be converted to $2010	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
32300	15	37	1	37	12	The total amount of R&D expenditure must be compared with the oil prices. The peiods of lower spending on R&D generally correspond to the periods when the oil price was low, and vice versa.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
29304	15	37	13			Change y-axis units to billions. Bottom bar is not in legend.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
38673	15	37	2	37	12	Private sector R&D is just as relevant to overall value. Private sector R&D needs to be added to this discussion. Also, the legend in the figure needs to be updated. The authors should make reference National Academies study on Americas Climate Choices and IEA's ETP 2012.	Noted, but private R&D is not a policy instrument. The cited ACC report is not useful for this section.
38674	15	37	2	37	12	Economic stimulus was well beyond just the US. The authors should revise the text to include other countries.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
29569	15	37	1	38	3	The numbers in the text and the figure are still not in line with each other. For example, the text mentions expenditure for energy efficiency, which in the updated figure falls into the category "other" and is not explicitly shown. Also, it still seems as if the peak was in 2009 and not in 1980 as is mentioned in the text. Finally, it would be interesting to know why expenditure as part of GDP has gone down so much.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
32982	15	37				Please clarify whether the numbers presented in these sections (largely referencing the IEA) are for all countries? Are strictly for energy? There seems to be a lack of information on other sectors, that would be very useful here.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
33078	15	37				Please coordinate more closely with Chapter 7 on the text in these sections. Much of this text may be better placed in the Sectoral Policies section of Chapter 7 and indeed may already be covered there. Because of this, section seems to have a skewed focus on energy. Here it would be more useful to pull overarching lessons across sectors.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
30187	15	38	1	39	17	Care needs taken with both FITs and RPS/RECs in the context of design, and broader electricity market issues. There is an implicit assumption that all FITs are somehow the 'German' design, whereas the UK at present is in the process of introducting a 'Contract for Difference' FIT where some key design issues are raised by financiers (public submission from the Low Carbon Finance Group to Department of Energy and Climate Change, comparing three types of FIT option (originally under consideration) from a finance perspective. A small qualification would sort this section out. As with earlier comments, policy stability - even with transparent review clauses, including grandfathering, is most important.	Noted. The discussion has been greatly abbreviated in the new draft, so that the comment is no longer relevant.
28166	15	38	1	38	3	Why is there no assessment of these figures? For example, it should be stated that - in comparison with its mitigation potential - the research funding for nuclear technology still seems very high.	Noted. This discussion has been dropped and replaced by a reference to Chapter 7.
21348	15	38	17	38	17	Insert: In terms of renewable energy, U.S. experience suggests R&D policy presents a strategic option to achieve significant carbon reductions in the near term and at a lower overall cost than a carbon tax (Byrne & Kurdgelashvili, 2011, pp. 62-74). Byrne, J., & Kurdgelashvilli, L. (2011). The Role of Policy in PV Industry Growth: Past, Present and Future. In A. Luque, & S. Hegedus, Handbook of Photovoltaic Science and Engineering, Second Edition. Hoboken, New Jersey: John Wiley & Sons, Ltd.	Rejected. The suggested insert does not seem to be consistent with other published findings. An email to the commenter requesting a copy of the cited paper (which does not appear to be peer-reviewed) was unsuccessful.
38676	15	38	18	38	19	This is a very old reference - something more recent should be included.	The date on the reference was incorrect; it is actually 1998. A 2013 reference was added.
38678	15	38	27	38	35	This whole paragraph refers to role of Gov't purchases, with only one reference coming since AR4. The authors should shorten the text and/or update the cited literature	Noted. Section has been rewritten; now draws largely on the sectoral chapters.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
28167	15	38	27	38	35	It is somewhat strange to dedicate a whole paragraph on the role of governments in the digital revolution. An example of government purchase much more related to climate change policies is the Energy Star Program. Swedish government has also purchased energy efficient goods in the past to foster market deployment. Further government purchase is already addressed in section 15.5.6. Delete or rewrite paragraph.	Accepted.
33086	15	38	36	38	46	The discussion of SRREN policy packages seems oddly placed here, particularly as the AR5 has defined its own set of policy packages that were agreed for use across all chapters. It would be more appropriate to discuss those categories of instruments as they apply to technology policy.	Accepted. Reference to SSREN policy categories has been dropped.
38679	15	38	36	38	42	Deployment of new techbologies is also driven by regs/standards/top runner type programs, not just purchases. Regulations of SRREN do not apply broadly. FITs are a FINANCIAL instrument, not a regulatory instrument. The text should be revised accordingly.	Accepted. Section has been rewritten.
24484	15	38	43	38	46	The description that FIT has encourged "development of renewable technologies" shoud be corrected to "development of renewable capacity", because FIT has encouraged only renewable capacity as the German case shows.	Noted. This section has been abbreviate so that comment is no longer relevant.
26758	15	38	43	38	46	It would be worth mentioning here already on the background of the German experience that total cost of a sufficiently high FIT can be very high	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
38680	15	38	43	38	46	The authors should include a balanced discussion of the pros and cons of the FITs, with appropraite references to the literature.	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
38675	15	38	8	38	16	There is substantial other literature on effectiveness of gov't R&D, Social ROI, etc that should be reviewed/addressed.	We looked for such literature and did not find it.
38677	15	38	26			In the US, states generally regulate utilities, setting rates, rates of return, and service terms. The extent to which any given technology might be put in place depends on whether state officials are willing to let a utility recover its costs and a return on capital. This is basically another administrative layer that can control the nature and scope of renewable development.	Noted, but this level of detail cannot be accomodated do to space constraints.
26831	15	38	41	38	41	After "… Portfolio Standard (RPS)" please add "and tendering/bidding". This should be added as auctions/tenders are increasingly being adopted in various countries around the world.	Noted. This section has been abbreviate so that comment is no longer relevant.
38681	15	39	1	39	6	The authors should revise to include newer literature on this. GEA, Rausch, newer Mitchell...	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
26852	15	39	39			Consider inclusion of the following- For instance, the significant growth in wind energy deployment in China has been due to a strong long-term legislative background, a clear tariff structure and strong industrial base. "IRENA (2012), 30 Years of Policies for Wind Energy: Lessons from 12 Wind Energy Markets (pg. 54), ttp://www.irena.org/DocumentDownloads/Publications/IRENA_GWEC_WindReport_Full.pdf"	The suggested citation does not appear to be peer-reviewed.
28168	15	39	42	39	48	Development of synthetic liquid fuels from coal is not a mitigation technology. Delete paragraph.	Accepted.
26759	15	39	7	39	10	Here it would be nice to include the Swedish RPS experience with cost per kWh around a 4th of the German cost	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
38683	15	39	7	39	11	The reference given is too old given the dynamics of the PV industry. Please update the paragraph	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
38682	15	39	7	39	7	Minimizing risk for whom? The text should state that the FIT subsidy reduces the risk for producers of/investors in renewable energy. The authors should provide a balanced assessment of who bears risk and for whom it is reduced.	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
26832	15	39	17	39	17	After paragraph "… FIT regime." please add a paragraph "In addition to FITs and RPS, tendering mechanisms are increasingly being adopted as they allow competition and thus price discovery and cost effectiveness; high investor security with long term purchase agreements; control on quantity and budget; and achievement of other benefits such as local employment and industry development. However, in the absence of appropriate compliance rules, they run the risk of underbidding and consequent delays in project completion (IRENA, forthcoming)." (Source: IRENA (forthcoming 2013), Assessment of Renewable Energy Tariff-based Support Mechanisms, policy brief)	Noted. Section has been rewritten, leaving details of FIT discussion to Chapter 7.C
26760	15	40	1	40	37	There is actual an active debate among economists especially in the law- and economics literature about the pros and cons. The evidence is not really strong even for developed countries	The text states "In general, the empirical evidence that IP protection stimulates innovation is limited to the chemical and pharmaceutical sectors, and to developed economies." This accurately represents the current state of this literature.
32301	15	40	1	40	6	Public R&D has multiple purposes which are not mentioned here. They include dissemination of information on new technologies, facilitation of adoption/realization in the market.	This section is focused on public R&D as a technology advancement tool. Other functions have not been studied systematically. (Comment gives no literature.)
29305	15	40	16	40	21	This ignores a large body of research of energy innovation, its drivers and implications. For example, numerous studies analyzing the development of wind technology in China have noted the benefits of joint R&D arrangements (based on technology sharing or licensing) between domestic and foreign firms to the expansion and tailoring of products for the Chinese market. Suggested citations: Lewis, J. (2012). Green Innovation in China: China's Wind Power Industry and the Global Transition to a Low-Carbon Economy. Columbia University Press; Ru, P. et al. (2012). Behind the development of technology: the transition of innovation modes in China's wind turbine manufacturing industry. Energy Policy 43: 58; Zhou, Y. (2012). Joint R&D in low-carbon technology development in China: A case study of the wind-turbine manufacturing industry. Energy Policy 46: 100; etc.	Noted. But the cited articles are mostly about technology transfer, not indigenous innovation. The chapter text notes that enforcement of IP rights may be important for technology transfer, and refers the reader to chapter 13 for more discussion of that issue.
38684	15	40	22	40	28	This text provides a limted perspective. Include Popp et al's work (next section) here, amoung many others who have evaluated IP re energy/climate.	Rejected. Popp's work certainly shows that people take out patents on energy related technologies, but that does not speak to the question of whether enforcement of IP rights in middle income and developing countries on balance stimulates innovation in those countries.
20192	15	40	26	40	26	The reference to ‘less developed countries’ should be replaced by ‘developing countries’ since the former is a category of countries already exempted from compliance with the TRIPS Agreement.	Accepted.
32302	15	40	30	40	37	Strong protection of IPR is essential to facilitate technology transfer among private entities as well discussed in Chaper 13, 9.3.2	Noted. The text acknowleges this and explicitly refers the reader to Chapter 13 for more detailed discussion.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
20193	15	40	33	40	37	The current text says: 'the evidence does suggest that the presence of an effective IP regime is a factor in fostering technology transfer into a country. There is therefore an inherent trade-off for less developed countries between the limitations on widespread deployment that may be created by strong IP protection, and the need for such protections as a market precondition for inbound technology transfer'. These statements are not consistent with the analysis in Chapter 4, section 4.3.6. They should be replaced by the following: ''the evidence suggests that the presence of an effective IP regime is not a factor necessarily fostering technology transfer into a country; it may rather pose obstacles to technology transfer and innovation (see Chapter IV, section 3.6)'. Given the inconclusiveness of the evidence with regard to the impact of IP on technology transfer and FDI, a recommendation should be included in section 15.13 to undertake studies on such impact, including on the barriers that IP create for access to up-to-date and efficient technologies by firms in developing countries.	I believe that our text accurately reflects the literature. The Hall/Helmers survey (2010) is quite comprehensive.
28169	15	40	4		6	Formulation not entirely precise. The economic reward itself is not increased by IP rights, they rather make sure that the inventor has the property of the economic value of his innovation.	Rejected. The formulation in the text is standard in the law and economics literature.
22242	15	40	1	40	37	This section only lists a very limited number of studies to come forward with very strong conclusions on the effectiveness of IPR on stimulating innovation or deployment. It is difficult to believe that these studies are conclusive on this topic. As such it is requested that you have a thorough look at this chapter to see if it truly represents existing scientific findings on IPR and its link to innovation. If not, we suggest you delete this section.	There is a sizable literature in this area, and the text as written reflects the consensus of that literature. Additional citations have been added.
30105	15	40	33	40	33	There is a mistake in the footnote10. Dechezlepr tre et al., 2011 show that China and Brazil contributed8.1% and 1.2% of worldwide innovation since2000 (not 1978). Moreover, when focusing on high-value inventions, there countries only represent2.3% and 0.2% of ĝlobal innovation Thus the contribution of emerging economies to global innovation is small(and much smaller than their share in global GDP).	Noted. Footnote has been deleted.
28170	15	40				Here, the study of Aghion, P., Dechezlepretre, A. et al. (2012): "Carbon taxes, Path Dependence and Directed Technical Change : Evidence from the Auto Industry" could be added. The authors show that higher fossil fuel prices in Europe in comparison to the USA have led to more innovation in energy efficiency by the European car companies in contrast to the American ones.	Noted. Citation has been aded. Will need to monitor if it is published in time to be used.
41944	15	40	2	40		Again, the open source model and approach to intellectual property could be mentioned here, along iwth its implications for the spread of technologies and ideas.	It is unclear exactly what is intended by the desired reference to the "open source model" with respect to mitigation technology. If what is meant is technology development without IP protection, then that possibility is implicit in the conclusion that IP is not neeed to foster indigenous innovation.
38685	15	41	29	41	35	Other references, e.g. NAS "Energy R&D at DOE" , etc should be included here.	The study cited in the text ((U.S. National Research Council, 2001) is, indeed, the NAS DOE study.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38686	15	41	36	42	4	Conclusion #2 is an assertion. There is no evidence on the pace of increase to impact effectiveness. In fact, the literature contains examples of the opposite--e.g fast ramping with positive impacts. The text should be revised accordingly. Conclusion #4 is questionable as a general conclusion. Under conditions of high C price, and multiple other policies, gov't purchases may not be "necessary", as the text claims.	Rejected in part and accepted in part. There is both theoretical reason and empirical evidence that rapid ramp-up is likely to lead to inefficient expansion. Conclusion regarding government purchases has been dropped.
38687	15	41	36	42	4	This statement needs confidence assessment/language and appropriate IPCC formulation	noted
41945	15	41	40	41	41	The argument that "the effectiveness of research support will be greatest if it is increased slowly and steadily rather than dramatically or erratically" does not seem to be well substantiated on page 38 (lines 18-25), which only cites examples from the United States.	There is a broader literature on adjustment costs. I'll get some more citations.
23376	15	41	9	41	12	Specific: could reference Newell et al. (1999) to corroborate the statement made in this paragraph; Newell et al. (1999) is already included in the references.	The original text was derived from Newell et al; the omission of the citation was an error. But in the need to shorten the text, this point has been dropped.
30106	15	41	1	41	8	More recently, Aghion et al. (2012) show that higher fuel prices increase innovation in clean vehicles (electric and hybrid cars) and reduce innovation activity in gasoline-based engines. Reference: Aghion, P., Dechezleprêtre, A. Hemous, D., Martin, R., and Van Reenen, J. (2012). Carbon Taxes, Path Dependency and Directed Technical Change: Evidence from the Auto Industry. Working Paper 18596, National Bureau of Economic Research.	Noted. Citation has been aded. Will need to monitor if it is published in time to be used.
30107	15	41	1	41	8	In a more recent paper, Calel and Dechezleprêtre (2012) show that the European Union Emissions Trading Scheme has encouraged innovation in clean technologies among regulated companies. This is the first empirical demonstration that carbon markets can encourage the development of carbon-saving technologies. Reference: Calel, R. and Dechezleprêtre, A., 2012. Environmental Policy and Directed Technological Change: Evidence from the European carbon market. Grantham Research Institute on Climate Change and the Environment Working Paper No. 75	Noted. Citation has been aded. Will need to monitor if it is published in time to be used.
29570	15	41	39	41	41	I find this an important finding that should be highlighted in the executive summary.	Noted. Executive Summary contains this language.
26761	15	42				This chapter lacks a discussion of second best solutions, where stringent caps very high taxes might be infeasible and thus can be complemented by other policys to achieve necessary abatement	rejected
33087	15	42	12			Reference t section 15.7.4 should most likely rather be to section 15.8.3.	This is correct. The reference should be to 15.8.3.
29293	15	42	14			Compared to the International Energy Agency New Policies Scenario, "achieving universal access by 2030 would increase global electricity generation by 2.5%. Demand for fossil fuels would grow by 0.8% and CO2 emissions go up by 0.7%, both figures being trivial in relation to concerns about energy security or climate change" but would avoid 1.5 million premature deaths per year (IEA 2011 World Energy Outlook Energy for All, retrieved from http://www.iea.org/papers/2011/weo2011_energy_for_all.pdf). The small increase in emissions is attributable to the low level of consumption per capita, and to the high proportion of renewable solutions adopted in this scenario. Business as usual scenarios would consider a higher share of Diesel generation for off-grid electrification, and this would rise the emissions from 0,7% up to a maximum of 1.5% if the preferred off-grid generation choice is Diesel compared to the IEA NPS. Additionally, higher levels of consumption up to 2000 kWh per year per person associated with a desirable economic growth would result in a worst case scenario where emissions would go up to a range from 1.6% for the new policies scenario to 3.6% in the off-grid diesel additional electrification.	noted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
33088	15	42	15	42	45	There is not a single reference in these paragraphs. Please ensure adequate referencing.	all that is needed is a reference to where "co-benefit" is defined.
38688	15	42	15	42	20	This statements assumes that climate is the central objective, which it may not be in many cases.	noted
34389	15	42	15	42	17	The WGIII contribution to the AR5 is named 'mitigation of climate change'; differentiating two goals, namely mitigation of GHGs and prevention of climate change, seems to be inconsistent. Please follow the glossary defintion of mitigation.	accepted -- change to "avoidance of climate change"
34390	15	42	17	42	20	Please follow the definition of co-benefits and adverse side-effects more closely than done in this paragraph; in particular, please make sure that co-benefits do not necessarily imply net welfare effects (refer to section 3.5.3 and the glossary).	noted
38689	15	42	21	42	26	Citing the literature on multimetric policy development would be appropriate here. The authors argue for advantages of mainstreaming/coordinating but do not assess the literature	rejected - unnecessary detail
19560	15	42	27	42	30	This point about mainstreaming is critically important; it would be helpful if this point was carried through to the section on capacity building (15.10).	noted
19546	15	42	40	43	3	This statement is true, but would suggest that low emission development strategies (adopted in Copenhagen, COP-15) be included in this paragraph as they focus on formulating integrated, consistent strategies on climate change mitigation. For example, the 2010 Cancún Agreements recognise that “a low-carbon development strategy is indispensable to sustainable development” (Decision 1/CP.16, Para. 6) (see: FCCC/CP/2010/7/Add.1).	noted
38690	15	42	40	43	3	There are insufficient citations to the ltierature here and without them it appears to be an assertion of the authors.	noted
34392	15	42	44			Please leave it to the governments to choose their prioirities or provide a reference otherwise. This also applies to the questions whether an objective is primary or secondary (lines 19, 22 etc.).	noted
20373	15	42	7	42	13	The outline proposed here is somewhat complicate. Any possibility ot make it more straightforward.	taken into account - text revised
32230	15	42	5	44	3	See comment 4 above regarding the need for more detailed examples of co-benefits arising from climate mitigation policies. This section is lacking in specific examples from individual countries and instead relies on hypothetical or abstract examples when the advantages and problems of co-benefits could be made clearer and more persuasive to decision-makers with real-world examples. As mentioned in comment 4, as rich vein of examples of co-benefits for rapidly industrialising countries are provided in: Bailey, I and Compston, H. (eds) 2012 Feeling the Heat: the politics of climate policy in rapidly industrialising countries, Basingstoke: Palgrave Macmillan (e.g. reducing urban air pollution in China and combating the health risks of black carbon through the provision of LPG cooking stoves to replace wood stoves in India). Of particular note in relation to links between climate policy and energy-security policy are the chapters by Afionis and Bailey and Howarth and Foxall, who review energy security as a major driver of climate mitigation measures in the EU and Russia respectively.	perhaps we can give an example or two
33089	15	42				It is unclear how this section fits together with 15.7.4. The message seem either to overlap or to be completely disconnected. One approach would be to condense this section substantially and refer rather to the co-benefits discussion in Chapter 6, which is more comprehensive.	taken into account - text revised

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
34391	15	42	14			This section is interesting but focuses almost exclusively on the concept of mainstreaming while providing little references to substantiate the various claims (no single reference on the first page!). From the perspective of the whole WGIII AR5, this is unfortunate because the reader would expect more information on the kind of policy instruments and implementation practices (e.g. for technology and carbon policy) that would allow co-benefits of mitigation options to materialize (because the bulk of literature assessed in sections 3.5.3, 5.7, 6.6, 7.9, 8.7, 9.7, 10.9, 11.7, and 12.8 covers these kind of co-benefits rather than mainstreaming). To that end, please consider assessing the references mentioned on page 9, lines 21-24 which seem to complement the mainstreaming dicsussion. Moreover, figure 6.32 suggests that focusing on, e.g., air pollution objectives as a primary objective will not lead to the same synergistic effects compared to a situation where mitigation is the primary objective. These kind of pitfalls of the mainstreaming concept are not covered here.	rejected -- this section does not focus exclusively on mainstreaming
19547	15	43	1	43	3	Suggest adding 'energy savings' and 'contributions to economic growth' as additional benefits to energy efficiency. There is a nice graphic that illustrates the multiple benefits of energy efficiency, see: Spreading the Net: The Multiple Benefits of Energy Efficiency Improvements, OECD/IEA, 2012, Figure 1, Page 6 (http://www.iea.org/publications/insights/ee_improvements.pdf).	noted
34393	15	43	1	43	3	It is not clear why energy efficiency measures primarily should fall into the realm of development policies. It is very well possible to design energy efficiency policies with mitigation as the single objective.	taken into account - text revised
34394	15	43	16			This statement is over-simplistic - considering that the synergies between mitigation and air quality have been well covered in the TAR already.	noted
34395	15	43	17	43	26	Please focus here on policy instruments to achieve the mentioned synergies and avoid trade-offs since the material presented here is already presented in sections 6.6 and 7.9. I suggest cutting these sentences to save space for the discussion of instruments and implementation.	noted
26601	15	43	25			ADD and the French support of diesel engines has led to serious NOx and PM problems in several cities, and a EU litigation against the country in 2012.	noted
38691	15	43	27	43	31	There are insufficient citations to the ltierature here and without them it appears to be an assertion of the authors.	generally agree -- the text seems a bit vague and I suggest changing it so that it simply indicates the links between trade/financial policies and mitigation.
34396	15	43	27	44	3	These paragraphs are in my eyes more relevant for the reader since they actually focus on policy instruments and implementation issues to allow co-benefits to materialize. However, little detail and few references are provided.	accepted -- would help to give a specific example.
38692	15	43	32	43	37	Using "should" implies policy prescription vs "relevant" analysis.	accepted -- text could be improved
41946	15	43	38	43	39	Government capacity, leadership, and influence (power?) seem to be influential rather than deterministic.	accepted -- this paragraph could be improved
38693	15	43	39	43	39	This is prescriptive langauge; it needs to be revised.	noted.
41947	15	43	42	43	42	Is "capacity" here referring to government capacity? If so, how does this compare with economic, technological, social, cultural and political barriers?	noted
38694	15	44	10	45	26	The authors should consider combining sections 7.3.1 and 7.3.2. and present them as a balanced analysis of the benefits/challenges of policies and different jurisdictional levels. The authors should also consider adding a table.	accepted -- Beginning of line 33 on page 49 needs correction. (Change "On" to "One."

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
20374	15	44	29	44	35	The parapraph is interesting but the first sentence is a good example of reductionism of local intiatives. Experimentation is geared to more than information : it is geared to experimenting and potientially innovating. Innovation such as nex problem framing, or new policy design cannot be reduced to information. The next paragraph is right : california did not inspire the federal state because of new information, but beacuse it experimented, pushed frontiers and proved unforeseen polcy objectives and design could be conceived and implemented.	accepted -- we should add this reference. It would be on line 39 on page 50 of the latest draft.
26762	15	44	46	44	46	The text currently reads: “On particular difficulty”. This should be “one particular difficulty”.	rejected -- too detailed
32984	15	44				Section misses any discussion of the relationship of international policies/frameworks on national policies. This would be important to include.	address -- text has been revised
32231	15	44	10	44	42	In relation to local and sub-national action on climate change on line 29 (also on page 11 line 29-47), the discussion would have greater balance and insight through the addition of the following points: (i) that local-level actions are likely to have a more limited impact on emissions than national or regional policies by virtue of their smaller geographical coverage and less integrated character; and (ii) for local-level actions are to have a greater impact on emissions, greater consideration is needed about the forms of institutional, legal, financial and other forms of support required for local-level experiments to be scaled up and disseminated to other local scales. This point might also be made on p. 49, around lines 33-36 but, wherever it is noted, it is important that thegovernance challenges of scaling up sub-national initiatives should be acknowledged in the report.	rejected
24959	15	45	1	45	19	While this section is correct in identifying short-term non-additionality of overlap between ETS and other abatement in covered sectors, there can be long-term environmental benefits. Suggest inserting on line 12: "However, where there is market uncertainty of the long-term carbon price and emissions caps, other mitigation policies can accelerate technological innovation, support a smooth transition to low emissions infrastructure, and avoid the need for abrupt turnover of capital stock at higher costs in the case of more ambitious emissions targets to meet long-term stabilization goals." - or similar	noted.
32985	15	45	10	45	25	Please link discussions of leakage to other points where the discussion occurs across the AR5, e.g. in Chapter 5.	accepted. Done.
26763	15	45	20	45	26	Not sure if the description is entirely correct, actually if the lower level authority enacts measures with higher marginal cost than marginal damage this might increase abatement cost from a societal perspective	noted.
28171	15	45	20		26	At the end it should be mentioned that the cap could be adjusted accordingly to avoid the negative effect.	noted.rectifying measures discussed.
38695	15	45	42	46	7	If the conclusions summarized in this paragraph are derived from CGE models, then this should be discussed because these models are highly stylized.	worth looking at, though I'm skeptical the examples will apply closely to what is discussed
20375	15	45	8	45	19	This paragraph is a bit contentious, by implicitly suggesting that a tax could be sub optimal in a context of cap and trade, because it could cause emission leakage. The problem can be seen from the perspective of a difficulty of cap and trade mechanism to politcially adjust to a dynamic context.? The adoption of a tax by the UK government can be interpreted as a change in Uk's poltical ambition, thus in EU's overall political ambition in mitigating GHG emissions. Why not, in the same setting, question ETS capacity to adjust to this dynamic context by evolving the cap? (see also remark 18 below -p51L1 ; p51L11)	noted- rewritten.
28172	15	45				Acemoglu et al. (2012): "The Environment and Directed Technical Change" seems to be another relevant source. The authors show that it's way more efficient to use a R&D subsidy and an emission tax to address the two market failures.	noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32232	15	45	31	45	35	In the first paragraph of this section, the authors may also wish to refer to Passey, R., Bailey, I., Twomey, P. MacGill, I. 2012 The inevitability of 'flotilla policies' as complements or alternatives to emissions trading schemes, Energy Policy, 48 (1): 551-561. This article discusses the use of so-called flotillas of small policies that tackle single market failures alongside, or instead of, flagship climate policies like emissions trading schemes. The article argues, among other things, that such flotillas of policies have the added advantage of, individually, imposing smaller costs and burdens on target sectors, thereby helping to improve economic efficiency while simultaneously attracting less political opposition than might a larger, more high-profile policy such as a nationwide emissions trading scheme or carbon tax. This links back to earlier comments regarding the need to take greater account of political obstacles to climate mitigation policy, in particular the potential influence on policy development of opposition from influential business groups. This point might equally be inserted on p. 47, in the paragraph in 15.7.4.2 (lines 12-14) concerning the justification of combining emissions pricing with other policy instruments.	noted
32233	15	46		48		The sections on problematic interactions (15.7.4.2) and National, State and Local Linkages (15.8) relies rather too heavily on hypothetical examples and the arguments made need to be supported by the inclusion of a greater number of empirical examples for them to be more persuasive to readers. Large sections of 15.7.4.2 (particularly on p. 46) also lack references to support the arguments made, as does 15.8.1. Although few examples exist of linking cap-and-trade schemes (15.8.1), this discussion would be aided, perhaps, by a brief example of linkages between the EU emissions trading scheme and the CDM: there is also a rich literature on this (e.g. Tuerk et al. 2009: http://www.mcc-berlin.net/fileadmin/data/pdf/Publikationen/Tuerk_Sterk_Haites_Mehling_Flachsland_Kimura_Betz_Jotzo_2009_Linking_Emissions_Trading_Schemes.pdf; the 2009 special issue of Climate Policy on linking schemes: doi:10.3763/cpol.2009.0665), and so on. Similarly, the discussion on federalism explores some interesting avenues but would be bolstered by some specific examples from the EU (partly covered in Chapter 14, but Jordan, A. et al. (2010) Climate Change Policy in the European Union: Confronting the Dilemmas of Mitigation and Adaptation? Cambridge University Press provides some useful instances of the vertical allocation of responsibilities on emissions trading and renewable energy policy, among other areas).	noted-rewritten.
32304	15	46	1	46	7	Is it really the case that policy combination of tax and R&D is cheaper than either one alone? The literature is old and there has been very significant changes since the beginning of the century. Scurutiny is necessary.	noted.
20376	15	46	19	46	25	same remark than before : the main results of the literature on the energy label shoud be presented somwhere in the chap.	Noted.
20377	15	46	26	46	44	This looks like a lecture, almost pure theory. No refs, no evidence.	noted- section revised.
38696	15	46	26	47	19	This section would benefit from add'l references to reflect the depth /breadth of literature	accepted -- might help to refer to concerns about redundancy under California's AB 32
28173	15	46	26	47	19	Section 15.7.4.2 is of little/limited policy relevance since the case of multiple policies and only one market failure is rather the exception. Section 15.5.4 described a number of market failures that are of high relevance for many existing performance standards. Since the discussion of section 15.7.4.2 gives little guidance to judge, in which cases a problematic interaction of policies actually prevails, it gives an unbalanced impression on the issue of problematic interaction. A clarification is desirable how to judge, if performance standards or other multiple policies actually interact in a problematic way with the core climate policy.	noted- revised.
32986	15	46	27	46	48	While this is well written and argued, not a single reference is given as support. Please include literature.	noted- this is revised.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
26602	15	47	19			ADD: A non economic example would be the following: efforts at decreasing traffic jams in order to reduce pollution and emissions levels leads to increased car uses (due to reduced mobility time) and reduced public transport attractivity (La Branche, 2011 « Les déplacements quotidiens face à la schizophrénie écologique. Le cas de Lyon », may 2012).	noted.
20378	15	47	21	50	13	These pages look like a theoretical and not very clear lecture. I am not sure of the relevance of such a development here. No references provided in the first two pages. Most of it is framed around price issues or from a price/ cap and trade / market oriented perspective. Then the discussion turns using evidence to discuss the relevance of theories (federalism vs polycentrism), instead of presenting the trends and evidence as regards national / local action in climate policy.	perhaps can add the parenthetical "whether the party is a nation or a firm"
38697	15	47	21	48	19	This section needs to analyze the literature.	noted.
24960	15	47	44	48	2	Unclear whether this is referring to firms or nations? Either way, the case for compensation seems dubious, as the entity facing higher prices due to linking will be able to sell the permits it holds at a higher price and undertake additional abatement at a profit. Suggest removing.	Firms.
32987	15	47		48		While this is well written and argued, not a single reference is given as support. Please include literature.	this has been revised.
21349	15	48	30	48	33	Comment: As Carley & Browne (2012) and Byrne, Hughes, Rickerson, & Kurdgelashvili (2007) demonstrate, practical applications do not only find theoretical backing but, through examination of applied cases, find strong empirical support as well. Carley Sanya, Browne Tyler R.. Innovative US energy policy: a review of states' policy experiences. WIREs Energy Environ. 2012. doi: 10.1002/wene.58 Byrne, J., Hughes, K., Rickerson, W., & Kurdgelashvili, L. (2007). American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State and Local Green Energy and Climate Change Policy. Energy Policy 35 , 4555-4573.	NOTED (This section deals with the theoretical arguments for subnational involvement in climate change policies: section 15.2 deals with the practical applications, whereas other sections of the chapter deal with the empirical assessment of their results) /*15.2/
26603	15	48	41			ADD this would apply differently for mitigation(where general global measures are applicable) and adaptation, which is, by essence, local in practice, even though general guidelines or principles can be developed at a higher, national or even regional (the EU, for example, has produced a series of papers on adaptation…). Thus federalism might be more efficient for some issues but less so for others, notably the understanding of climate change on impacts on, for example, agricultural production, jobs, construction methods, avalanche, water management which all depend on local conditions.	NOTED (The last paragraphs of the subsection indicate that decentralization of climate policies has limits, which are related to the different nature of the several problems faced by public administrations).
29571	15	48	8	48	10	Given the relatively low volume of total trades and the fact that most countries covered by the EU ETS share the same currency, the presented evidence is rather weak.	noted
24961	15	48				This section is useful - recommend that it is retained if the chapter is shortened	NOTED
32687	15	48	38	48	39	On this point - the basic responsibility of the federal government - public opinion is in-line. See Figure 8 in Lachapelle et al. 2012. Lachapelle, Erick, Christopher P. Borick and Barry Rabe. 2012. Public attitudes toward climate science and climate policy in federal systems: Canada and the United States compared. Review of Policy Research 29(3): 334-357	ACCEPTED (New cite added)

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
21350	15	49	15	49	23	Insert at end of paragraph: In the U.S., states have captured these opportunities and have moved forward in formulating climate and energy strategies that, together, build a substantial momentum. Some have relied on renewable energy standards, others have adopted feed-in tariffs, and still others have innovated in the use of community aggregation to speed entry of renewable energy into jurisdictions (Carly & Browne, 2012; Byrne, Hughes, Rickerson, & Kurdgelashvili, 2007). Carley Sanya, Browne Tyler R.. Innovative US energy policy: a review of states' policy experiences. WIREs Energy Environ. 2012. doi: 10.1002/wene.58 Byrne, J., Hughes, K., Rickerson, W., & Kurdgelashvili, L. (2007). American Policy Conflict in the Greenhouse: Divergent Trends in Federal, Regional, State and Local Green Energy and Climate Change Policy. Energy Policy 35 , 4555-4573.	NOTED (This section deals with the theoretical arguments for subnational involvement in climate change policies: section 15.2 deals with the practical applications, whereas other sections of the chapter deal with the empirical assessment of their results) /*15.2/
30533	15	49	24	49	35	while the text points out that "sub-national governments are now responsible for matters that have huge effects on GHG emissions:…" (lines 29/30), the references stated do not cover the more recent developments, including the merits of a split up of GHG mitigation responsibility across jurisdictional levels, as given in Wolkinger et al. 2012. Therefore, in line 33, add this reference within the bracket? Reference: Wolkinger, B., Steininger, K.W., Damm, A., Schleicher, S., Grossmann, W., Türk, A., Tatzber, F., Steiner, D. (2012), Implementing Europe's climate targets at the regional level, Climate Policy 12: 667-689, http://dx.doi.org/10.1080/14693062.2012.669096	noted
20379	15	49	29	49	34	The importance of local goverment action is mentioned and recognized in these lines. This should be given more room in the chapter, so as to present the content and the reach of these intiatives.	NOTED
21351	15	49	40	49	41	Add cites: The prevalence of sub-national actions in the field, contentious to other approaches, may be actually a proof of polycentrism in the area (Sovacool, 2011; Byrne, Hughes, Rickerson, & Kurdgelashvili, 2007; Carley & Browne, 2012)	ACCEPTED (New cites incorporated)
19548	15	49	44	49	48	This is an important point that should be reiterated in Section 15.10.1, highlighting the critical role that certain sub national governments can have in terms of leadership in capacity building.	noted.
26825	15	49	46	49	46	After "...(Kousky and Schneider, 2003)." please add "For example, the conversion of a landfill site, which was the largest local source of GHG emissions, into a waste to energy facility in Belo Horizonte, Brazil was driven by the active involvement of the local government (Source: IRENA and ICLEI (2013), Waste to Energy for More Effective Landfill Site Management – Belo Horizonte, Brazil, Renewable Energy Policy in Cities – Selected Case Studies, http://www.irena.org/Publications/RE_Policy_Cities_CaseStudies/IRENA%20cities%20case%203%20Belo%20Horizonte.pdf)".	NOTED (This section deals with the theoretical arguments for subnational involvement in climate change policies: section 15.2 deals with the practical applications, whereas other sections of the chapter deal with the empirical assessment of their results) /*15.2/
20364	15	5	1	60	22	General remark about the chapter : The general framing in this chapter and its excutive summary is geered towards carbon pricing in such a way that other policies and actions in the domain of GHG mitigation appear to be relevant ony if they serve the removal of barriers to price (e.g. p5 L19-20 ; p6 L11-14 ; p6 L38-39) rguable that price instruments can be an interesting option to reduce GHG emissions, local (governement) initiatives in GHG mitigation or institutional innovations have goals and outcomes - such as new problem framing, the devising of new institutional settings ... - that do not boil down to the removing of barriers to price. The result is a pervasive bias in this chapter, from the outlline of the chapter to the detailed phrasing, that infeodates actions in the field og GHG mitigation to a better functioning of price instruments.	Noted- discussion on carbon pricing has been made more balanced.
31152	15	5	19	5	24	The 'pillars' used to classify policies do not seem to apply well to the policies examined. For example, price mechanisms are similar to feed-in tariffs in their effect on businesses. The typology used in section 15.3 is more traditional, and would classify both price instruments and tariffs under economic instruments.	This has been removed.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
25101	15	5	19	5	24	Though I agree with the classification in separating short-term and long-term policies, I am not sure this classification of short-term policies is supported by literatures. If we follow this logic, functioning price signal is the only objective of any climate policy at least for a short-term and may lead to misunderstanding that an economic incentive relying on price signal is superior to others. For example, is the purpose of regulations such as emission standard from power plant to remove barriers to acting on the price signal? This is not true. The purpose is to reduce emissions by regulation, but not by price signals. Also as stated in line 25 of the same page, it is true that there is no best policy. This means price signal is not necessarily the best policy. From other perspective, price signal itself is a policy to remove barriers. Suggest deletion of this paragraph and replace with traditional classification as economic incentive, direct regulation, voluntary measure, R&D and others including government procurement and information measures such as labels. If this comment is accepted, substantial rewritings are necessary from line 8 to 36 of page 6.	This table has been removed.
28128	15	5	20	5	20	The category "barrier removal policies" reads a bit odd. This is not a standard category for policy instruments and is inconsistent to categories used by other chapters. At least explain why you created this category (grouping according to purpose of instrument?)	This table has been removed.
26597	15	5	24			ADD In addition to economic policies, there also exists regulation such as building laws in France since 2012 that obliges constructor to reach a 50Kw/H/m² energy efficiency in all new constructions; climate and energy plans are now mandatory for all communities of over 50 000 and include carbon evaluations, buildings norms, urbanism, density, energy, renewable energy promotions and minimum standards, etc…	Noted- regulations have been discussed; policies from sectoral chapters like buildings have been brought into the chapter
38606	15	5	25	5	26	"roles" is not the correct word or concept. "Effectiveness" might be more appropriate; "targeting" might also be mentioned. If the text is going to mention "combinations of policies," it also needs to explicitly state how complex implementation is likely to be.	Noted.
20382	15	5	26	5	27	"Policies should … " : the formulation is prescriptive. Change for evidence based statement.	Noted.
38607	15	5	27	5	27	Prescriptive statement re "there is no best policy". Rephrase.	noted.
28129	15	5	29	5	30	I think "categories" refers to the different policies. Right now, especially with the last sentence talking about national circumstances, this is not clear.	This has been revised.
21411	15	5	31	5	31	Please replace "economic instrument" by "carbon pricing". Also please note that regulatory approach is often taken to implicitly set carbon price for sectors/technologies.	Classification of policy instruments is made consistent throughout the IPCC process.
40761	15	5	31	5	31	Replace "emission tax and cap-and-trade systems are cost-effective" by "energy, fuel and emission tax and cap-and-trade systems are theoretically cost-effective" . In reality the tax/ETS systems are distorted or with high transaction costs and not always cost effective.	This has been revised.
25627	15	5	32	5	32	Add "theoretically" in front of "cost-effective". In reality the tax/ETS systems are not always cost effective.	This has been revised.
24478	15	5	32	5	32	It should be replaced by "Emissions taxes and cap-and-trade systems are theoritically cost-effective policy instruments."	This has beenr revised.
21410	15	5	32	5	32	Please replace "emission tax and cap-and-trade systems are cost-effective" by "energy, fuel and emission tax and cap-and-trade systems are theoretically cost-effective". In reality the tax/ETS systems are distorted or with high transaction costs and not always cost effective.	This has been revised.
25056	15	5	32	5	32	Insert "theoretically" before "cost-effective".	This has been revised.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38608	15	5	32	5	45	Improve treatment of economic instruments in this section . For example, the "acceptability" of any particular tax depends at least partially on the other taxes that are part of a country's tax regime. For example, if the only tax individuals were asked to pay was a carbon tax (no capital or labor taxes) it would probably be "more acceptable." Instead of "...raising the price," it is more appropriate to state "placing a positive price on carbon...". Further, the authors should include permit distribution systems, e.g allowances in the discussion of cap & trade instruments.	Discussion of policy instruments across criteria has been made more balanced.
40762	15	5	32	5	32	Replace "economic instrument" by "carbon pricing". Also note that regulatory approach is often taken to implicitly set carbon price for sectors/technologies.	Classification of policy instruments is made consistent throughout the IPCC process.
28130	15	5	32	5	32	Please add "cost-effective policy instruments in the short term".	Noted.
23124	15	5	33	5	33	Replace "medium evidence" by "robust evidence", as there is substantial evidence that emission trading systems have harnessed least-cost reductions, as long as they have not been overallocated.	Noted.
20228	15	5	34	5	37	"Reduction of subsidies to fossil energy can result in major emissions reductions at negative cost" (Robust evidence, high agreement)? -- Only one study was cited as evidence (Burniaux and Chateau, 2011)!	This has been addressed.
31153	15	5	34	5	34	This is the first mention of subsidies in this chapter. The term is used numerous times in this chapter, but with no definition in the chapter or glossary. More specificity as to what constitutes a subsidy is recommended. Subsidies can be defined as either tax credits, the provision of some type of cash transfer to an industry or company (e.g. grants) or by not charging a user for a service. An example of the last sort of subsidy is providing an industry with water at no cost. The free provision of other natural resources, or government services (e.g. for clean-up, remediation or ecological restoration) may also be perceived as subsidies. There is much debate about this idea, therefore clarity is suggested.	Noted. Thank you.
28131	15	5	34	5	34	Before "Elimination or reduction.." please add "In contrast to emission taxes, a cap-and-trade system guarantees that the defined goals are met." since this is an important distinction between a tax and a cap and trade system.	The ES has been revised.
24479	15	5	39	5	40	Although there is a description that "Carbon and fuel taxes have often been initially resisted but once introduced, the level has often been raised and this has been acceptable", this concrete evidence is unknown and it should be deleted.	Noted.
28132	15	5	40	5	40	"hypothecated instruments" i.e. refunded emission payments needs an explanation, because it is not a well known instrument.	Noted.
28133	15	5	43	5	43	Please change "typically" to "initially" - The Californian system, for example, does probably not support this hypothesis (if assumed growth prevails). Even the EU-ETS was supposed to induce scarcity from the 2nd and especially from the 3rd period on. The economic crisis then lead to an affluence of emission certificates. In the case of RECLAIM and SO2 certificates were scarce from the 2nd phase on.	Noted.
38609	15	5	44	5	44	It is not clear what "lax" means. If this means the caps are not binding, then the text should say that. A non binding cap is one reason the price could be low. There are other reasons, including the fact future expectations of prices.	Noted, this has been clarified.
38605	15	5	6	5	6	The text here borders on being prescriptive. IPCC should be science/literature assessment that is policy relevent, but not prescriptive.	This has been taken into account.
26274	15	5	8	5	9	15.11.3 Provision of local public goods by government as ways to mitigate and adapt simultaneously could be shortened to 15.11.3 Provision of local public goods by government	Noted.
41941	15	5	9	5	11	As discussed on page 8, it is policy paradigms rather than policies that colour the way in which problems are perceived.	Agreed.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32970	15	5				The Executive Summary does not adhere to the guideline circulated by the TSU. Please restructure accordingly, paying careful attention to the application of uncertainty language, which should be applied to each key finding of the chapter.	Noted- ES has been revised.
28127	15	5	1	7		ES of other chapters don't have sub-headings in their ES. You might want to skip these for the sake of consistency in style. It would add to the comprehensibility of the ES if the key results/messages were presented in bold in the first sentence of each paragraph. The ES is also quite lengthy.	Noted- ES has been revised.
26513	15	5	23			…after "or heat." include: "In order to address barriers related to social capital and human resources, employment measures could include education, technical and vocational training, enterprise development and social dialogue."	Thank you.
26156	15	50	15	50	23	Further evidence about the extent to which 'experimentation' is an important part of the sub-national response to climate change can be found in (a) Bulkeley, H. and Castán Broto, V. (2012) Government by experiment? Global cities and the governing of climate change. Transactions of the Institute of British Geographers, Online First 10th July 2012, DOI: 10.1111/j.1475-5661.2012.00535.xand (b) Castán Broto, V. and Bulkeley, H. (2012) A Survey of Climate Change Experiments in 100 Cities, Global Environmental Change, forthcoming; available online 1 September 2012	agreed; new cites incorporated
38699	15	50	17	50	25	IPCC should not defer to "simplified' economic analysis, but assess the literature. This chapter discusses a range of instruments, and should assess their effectiveness, not postulate a 'simple' cost effective solution that in fact has little empirical evidence for being effective as a sole instrument. The authors should consider removing lines 17-21 - keep only the last few sentences of paragraph, starting with "In addition to a carbon price…"	noted.
38700	15	50	20	50	20	The political commentary is unwarranted and inappropriate. The authors should stick to literature assessment.	noted.
19760	15	50	31	50	35	Since rebound effects are caused by faster economc growth enabled by efficiency improvement, it is economically and environmentally better than no-efficiency improvement. The justification of eliminating rebound effects by imposing higher carbon price (to remove efficiency improvement benefit) is upto policymakers descision.	noted.
38701	15	50	43	50	43	Statements on the importance of lobbying should be included only if supported by literature.	noted- literature added.
26604	15	50	6			ADD this is the case in France, where adaptation actions are embedded in a national legal framework called Territorial Climate and Energy Plans, which are seen as locally-based experiments that will eventually offer lessons and information aimed at improving a national adaptation strategy.	noted.
38698	15	50	7	50	13	This section could be categorized in a text box or table and then concisely summarize the literature on the differences/rationale of using different approaches, but also the effectiveness. Earlier sections described political feasibility - could that be covered here as well?	balanced has been sought.
32234	15	50	8	50	8	A more accurate conclusion would be that 'there is theoretical backing for the allocation of some climate-related policies to sub-national governments…' (i.e. insertion of some) to avoid giving the impression even with the follow-on statement that sub-national action should be or has the capability to become a/the main arena of climate mitigation policy and, therefore, that less onus should be placed on national policy.	NOTED (The last paragraphs of the subsection clearly indicate that decentralization of climate policies has limits)

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32235	15	50		51		Following on from my comment 2, this section should incorporate a brief paragraph identifying political opposition to climate mitigation policies as an important consideration for policies for abatement and new technology. Without at least noting the potential for policies to be opposed by opposition political parties, electorates or other non-state groups, the danger is that the impression is given that governing climate change is predominantly a matter of instrument choice and that choices about instruments and their calibration are made purely on the basis of modelling of environmental and economic effectiveness, rather than considering issues such as political acceptability. For instance, it should be mentioned that the literature suggests that emissions trading schemes tend to be more politically feasible to introduce than carbon taxes because they offer a greater prospect of economic advantages to business that are able to innovate rather than imposing an indiscriminate and immediate financial burden on businesses and citizens. Similarly, policies that provide financial incentives or assistance for innovation (i.e. financial carrots and prospective first-mover advantages) may be more politically acceptable than those that focus predominantly on financial sticks and create only indirect possibilities for market advantage for innovation. This longstanding debate on carrots versus sticks should be acknowledged while also noting that political feasibility can have a strong influence on decisions related to the introduction, timing and calibration of climate policies.	accepted - text revised
24962	15	51	1	51	18	Conclusion overstates the benefits of carbon tax vs. ETS. Suggest adding: "However, unlike linked ETS's, carbon tax abatement costs cannot be reduced through policy harmonisation across countries. Further, an effective carbon tax requires governments to estimate an appropriate cost to drive the desired environmental outcomes. This is difficult to achieve, and can be administratively difficult to adjust once set." - or similar.	noted. Thank you.
26764	15	51	1	51	4	Cap-and trade introduces price volatility which is correctly stated, while taxes are usually more susceptible to political risk and depend more on the economic environment and budget needs	noted. Mentioned.
20380	15	51	1	51	11	This paragraph seem to relfect a bias in favour of cap and trade approach. It is clearly said that cap and trade face a difficulty in adjusting the cap so as to make this instrument stringent enough to be efficient (or effective) in GHG mitigation. So it is not right to say that ETS "can deal with this issue" : it did not, as proved by empirical evidence. Dealing with this issue is politically difficult for a cap and trade mechanism too. So, while price floor and ceilings may render cap and trade systems closer to tax instruments (thus convoke the spectrum of political sensitivity of tax systems), the problem is not the tax : the problem is the political difficulty of imposing the cost of carbon externalities on actors. Evidence shows that cap and trade, while different from a tax, is not exempt from such a difficulty.	text revised.
38702	15	51	1	51	11	This statement is incomplete. The authors likely mean "…3 degree increase in average global temperature stabilization"	correct point
38703	15	51	15	51	18	The text addresses political feasibility vs effectiveness….As such, the text should be revised accordingly	agreed -- it should be made clear what is the criterion for "insufficient"
26765	15	51	4	51	6	That ambition levels are to low is not really a fault of Cap-and trade system but a political failure that usually holds for taxes to	noted.
26766	15	51	6	51	7	The text currently reads: “have been insufficiently ambitious relative to the requirements needed to achieve a 1.5 degree, 2 degree or even a 3 degree”. There appears to be (a) word(s) missing at the end of this sentence. “Needed to prevent a 1.5 degree, 2 degree or even a 3 degree rise in global temperatures” is one suggestion.	text revised.
19761	15	51	8	51	9	We must be careful in mentioning about "tightning the cap when it ceases to bind or if the permit price falls too low". If the emission permits(credits) are traded in market, keeping trade prices by supply control by tightening of cap is the manupulation of market by politics. Such market is very vulnelable against lobbing and inside(unfair) trading. Thus this can only be achieved by the cost of deterioration of soundness/fairness of the carbon market.	text revised.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
19762	15	51	20	51	24	This is a good comment and should be kept as it is.	noted.
26605	15	52				Three Roles of Climate Policy Instruments: why are these economic instruments only? Where are public policies such as building codes, minimal energy efficient, actions on public transports…? The role of policy makers is not limited to economic policies! ADD: to these economic instruments, one can also mention building codes, energy efficiency norms, actions on mobility, social instruments and environmental policies: the city of Paris now has vegetalisation standards and a biotope coefficient on all new urban projects as well as programs for already existing buildings so as to improve adaptation to summer heat waves and temperature increase due to climate change. It also aims at improving biodiversity (City of Paris, Développer le végétal à Paris, les nouvelles règles du Plan Local de l'urbanisme de Paris. Oct 2004. The city of Lyon has developed a canopy ratio which measures the cooling effects of different tree species, their arrangement (Grand lyon, La Charte de l'Arbre, 2011).	Table removed
29656	15	52	1			Recommend deleting. This table is confusing without the context provided by the rest of the chapter, and its categories are inconsistent. For example, "Suitable context" is not rigorously definable, and it is unclear how the concepts included in that category are of the same nature. The columns are also overly constraining and do not lend themselves to clear categorization - price signals are also long-term investments, and feed-in tariffs are not necessarily long-term investments at all. The table is also heavily focused on greenhouse gas emissions from the energy sector in particular and fails to cover any meaningful breadth of mitigation strategies. If it is not removed, it should at minimum be substantially revised to reflect these concerns.	Table removed
26928	15	52	1			This table is confusing without the context provided by the chapter, and the choice of categories appears not to be consistent. Recommend deleting. For example, "Suitable context" does not have any definable boundaries, from general applicability ("entire economy") to types of activities ("technology development") to aspects of markets ("information asymmetries"). It is also widely acknowledged that putting a price signal on carbon will help stimulate long-term investments, hence the column choices cannot stand alone without the text descriptions of each category on p. 5-6.	Table removed
29306	15	52	1			This table is confusing without the context provided by the chapter, and the choice of categories appears not to be consistent. Recommend deleting. For example, "Suitable context" does not have any definable boundaries, from general applicability ("entire economy") to types of activities ("technology development") to aspects of markets ("information asymmetries"). It is also widely acknowledged that putting a price signal on carbon will help stimulate long-term investments, hence the column choices cannot stand alone without the text descriptions of each category on p. 5-6.	Table removed
26606	15	52	16			ADD But involving stakeholders may not always lead to better ecological results. Indeed, Souami shows that participation in urban projects are not related to environmental objectives nor levels of ambition. Touafik Souami. Ecoquartiers. Secrets de fabrication. Analyse critique d'exemples européens. Ed. Les carnets de l'information. 2009.	Accepted - reference added, although it is a book rather than a peer reviewed article.
19763	15	52	17	53	11	Here, only behaviors and motivations of business are described. More important aspect of business inbolvement to climate policy is that it has critical role and key instruments for the policy implementations. The role and importance of business in mitigation and adaptation has been not necessarily well focused, though the private sector does have vast variety of technologies, know-hows and capitals necessary to combat with Climate Change riscs.	Section deleted in rewrite. The role of business and finance in particular is covered in a more focused way in Chapter 16.
24963	15	52	22	53	1	The Australian Government notes comments made by ExxonMobil that this policy position and funding attributed to ExxonMobil is not current. ExxonMobil Australia has stated in response that it has "ceased funding groups we believe were addressing the public policy discussion by questioning the science of climate change as opposed to exploring solutions to this complicated challenge."	Accepted. The text has been clarified to reflect that this was a past position.
26767	15	52	22	52	24	(Antilla, 2005; Boykoff and Boykoff 2007) are missing in the reference section.	Accepted - these references have been listed.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38704	15	52	4	54	24	This section is descriptive and could be improved. Prior language implies significant importance of business sector (lobbies), but this is downplayed here. It also does not cover what businesses are doing re mitigation/efficiency, supply chain mgmt, etc. CDP, Greenbiz, etc cover some of this...	Noted. Some of this is dealt with by the addition of a mention of Corporate Social Responsibility (see 545 above)
32236	15	52		53		The section on businesses and the business sector notes that businesses may oppose climate policies and promote climate scepticism, but needs also to contain a clear statement identifying the political stakes for governments of strong opposition to climate policies by business groups. These were forcefully demonstrated with the Australian Carbon Pollution Reduction Scheme (Bailey, I., MacGill, I., Passey, R. and Compston, H. 2012 The demise of the Australian Carbon Pollution Reduction Scheme: A Political Strategy Analysis, Environmental Politics, 31 (5): 691-711, doi:10.1080/09644016.2012.705066; also MacIntosh et al. 2010 reference on p. 86 (lines 16-18)) but business lobbying has produced noticeable effects on the design of the UK's climate change levy and agreements and most other major climate policies (see Bailey, I and Rupp, S (2006) The evolving role of trade associations in negotiated environmental agreements: the case of United Kingdom Climate Change Agreements, Business Strategy and the Environment, 15 (1): 40–54, for a survey of the lobbying tactics and coordinating roles played by business organisations in the UK). Lorenzoni et al. (2008) also provide a rounded discussion of the political effects of business lobbying and actions on climate policy in the UK, http://napa.vn:8080/uris/uploads/1/0230202047.Palgrave.Macmillan.Turning.Down.the.Heat.The.Politics.of.Climate.Policy.in.Affluent.Democracies.Jan.2009.pdf#page=122	agreed. Included.
32988	15	52		53		The separation of the Business and Business Sector seems inappropriate here, particularly as the subsequent section covers "organisations representing business or industry interests". If kept, please clarify exactly what is meant by 'business'. As a bigger issue with this text, the current reading of the Business section is inappropriate for the IPCC in its seeming attack of business perspectives. Please remove entirely or rewrite with careful language.	agreed. Text is rewritten.
22470	15	52	3			It would be worth mentioning somewhere in this section that emissions trading schemes are more politically feasible than carbon taxes in that while carbon taxes disadvantage and therefore antagonise all those to whom they apply, this is not true of emissions trading because such schemes advantage and therefore elicit the support of those who are able to reduce their emissions below their allocation and therefore profit by selling permits.	Agreed. A very similar point is now made in the section on political feasibility and instrument choice.
22471	15	52	3			It should be pointed out that stakeholders who benefit from high emissions activities will oppose stronger climate policies and may be able to: block them, for example via allies in the legislature; frustrate their implementation, for example when energy companies decline to take advantage of incentives to build power stations equipped with CCS; or impose significant political or economic costs if they are implemented, for example energy-intensive manufacturing firms that (threaten to) redirect investment to other countries. See, for example, Pezzey, J, Mazouz, S & Jotzo, F 2010, 'The logic of collective action and Australia's climate policy', Australian Journal of Agricultural and Resource Economics, vol. 54, pp. 185-202. While accurate information appropriately framed may help in such cases, for example arguments that stress economic opportunities and co- benefits, acceptance of stronger policies may require stratagems such as package deals whereby governments provide compensating benefits elsewhere, as happened in Britain in 2001, for example, when the introduction of the Climate Change Levy was compensated for by a cut in National Insurance. See, for example, Compston, Hugh (2010), 'The Politics of Climate Policy: Strategic Options for National Governments', Political Quarterly 81(1): 107-115.	Agreed. Text has been revised.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
22472	15	52	3			It should be noted somewhere in this section that business opposition cannot be ignored because it can lead to economic and therefore political problems due to the capacity of many firms to withdraw or redirect investment in response to policies they don't like.	Agreed. Text revised.
19541	15	52	3	53	11	The section dealing with the business sector should mention the growing role of Corporate Social Responsibility (CSR) practices within the business sector, including Creating Shared Value (CSV). One might also highlight the role of Caring for Climate--the UN Global Compact and UN Environment Programme's initiative aimed at advancing the role of business in addressing climate change (http://caringforclimate.org/) to illustrate	Noted. However, as the focus of the chapter is on national and sub-national policies, the thrust of this section is how stakeholder interests determine policy choice. Plus, the Global Compact and simllar programs have not been discussed as we're focused on national and subnational level processes
22543	15	52	4	54	24	The role of regional governments, known as sub-nations, must also be taken into account. As an exemple we see networks like www.nrg4sd.org with more than 50 regional governments from 30 countries. At the same time nrg4sd colaborates with 7 other subnational networks. nrg4sd estimated that about 80% of adaptation and mitigation actions are implemented at the sub-national level, that means regional and local level	Regional level action has been discussed in other parts of the chapter; see 15.2 and 15.7,8
28174	15	53	1	53	3	As it stands, this sentence is not understandable.	Accepted - the sentence has been changed from 'divergences' to differences'
26157	15	53	3	55	24	Further detail on the role of private/non-governmental actors at the urban scale is given in the references listed above. Also to note there is considerable overlap here with some of the discussion in Chapter 13, which takes a more detailed approach to discussing the different roles that these actors have played. There may be scope to enhance consistency between these chapters on these points.	Editorial? It would make sense to ensure Chapters 13 and 15 fit together
20381	15	54	1	55	42	lack of references	Addressed
38705	15	54	25	56	13	This whole section is prescriptive and includes assertion vs literature assessment. Use of "appears" is unacceptable- Use IPCC confidence language or omit. Authors should refer to WG2 research and assessment.	Addressed
19549	15	54	42			This sentence, while very important, needs to be rephrased. Perhaps something such as, "Climate change is likely to reduce agricultural productivity, especially in the tropical regions, and to directly affect poor people's livelihood assets—including health, access to water and other natural resources, homes, and infrastructure (World Bank 2010). Moreover, increasing climatic variability will likely make poor households even more vulnerable, which could in turn exacerbate the incidence, severity, and persistence of poverty in developing countries. In this context, climate change represents a serious challenge to poverty reduction efforts around the globe." Source: The Poverty and Welfare Impacts of Climate Change, World Bank, 2012, https://openknowledge.worldbank.org/bitstream/handle/10986/9384/714510PUB097800C0disclosed070250120.pdf?sequence=1	Included
41948	15	54	42	55	10	A discussion of leadership capacity could cite the relevant literature on leadership. It is not clear why the discussion on vulnerability, destitution, etc. is located here. Negotiating capacity is discussed, but the capacity to negotiate will is not always equated with leadership, and in some cases it undermines leadership. If leadership is considered to be a determinant of government capacity, it should be discussed in reference to all countries, not just developing countries.	Rewritten, no longer relevent

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
33077	15	54				This section fails to present an assessment of the literature expected of the IPCC. Very few references appear in the text. While there are some useful points from the UNFCCC, the section fails to then expand on its recommendations to discuss e.g. human, scientific, technological etc. aspects of capacity building. It would be useful to pull key lessons from the capacity building chapter in the Global Energy Assessment, and perhaps pull CAs from that team to rework this section substantially.	The Capacity Development chapter of the Global Energy Assessment is now referenced.
19542	15	54	25	56	13	In general, the capacity building section (15.10) does not build upon important concepts and linkages made earlier in chapter 15, including the importance of capacity building at the municipal level for incorporating greenhouse gases and its co benefits into the planning process (see 15.5.6); the importance of co-benefits, which are a driving force for institutional building and policy making (see 15.5.6); the fact that there has been a shift in policies and strategies that deal with climate change (see 15.2.2), that could likely be a result of capacity building efforts; and the importance of mainstreaming (see 15.7.2). Given the focus of this chapter (national and sub national policies and institutions), these linkages should be carried forth through this chapter and emphasized in the section on capacity building.	Links to other parts of the chapter probably still needs to be considered.
19543	15	54	25	56	13	Because Working Group III deals with mitigation, certain mitigation sectors should be included as key sectors for capacity building, namely: low-carbon development strategies or plans; Nationally Appropriate Mitigation Actions (NAMAs); Monitoring, Reporting and Verification (MRV); Technology Needs Assessments (TNAs); mitigation assessments; as well as other efforts to enhance or create an enabling environment. These capacity building areas under mitigation have been highlighted in recent UNFCCC documents, namely the Summary report on the first meeting of the Durban Forum on Capacity Building (see: FCCC/SBI/2012/20) and the Synthesis report on the implementation of the framework for capacity building in developing countries (see: FCCC/SBI/2012/21) among many others.	These refs still need to be included.
26521	15	54	30			…change "tools and skills to address the various issues" into "workers skills and tools, renewable energy enterprieses and conducive markets to address preconditions for successful climate and renewable energy policy."	Rewritten, no longer relevent
26080	15	54	41	56	13	The structure on "Capacity Buidling" looks very random, without appropriate balance of items to be raised; whiel acknowledging the importance the points raised as 15.10.1 through 15.10.4, they are not something described in a paralle way, and should be reorganized in a better taxonomy.	New taxonomy attempted.
26081	15	54	41	55	10	While leadership capacity is important, but why this is only singled out in the broad area of capacity(In development cooperation practice, which is also applicable to capacity building in climate change area, usually refers to more elements to asses the effectiveness of capacity-building work, such as ownership, creating enabling environemnt etc.)? Why do we only highlight leadership in terms of international negotaition, while ignoring leadership capacity which are very important for the domestic work of mitigation and adaptation efforts?	Addressed
26522	15	54	45			…after "migration" include: " loss of employment and livelihoods" Source: ILO, 2011 "Towards an ILO Approach to Climate Change Adaptation".	Rewritten, no longer relevent
19552	15	55	18	55	19	Capacity building is not just about research and education; it can be a means to an end, or an end in itself. Capacity building needs to be a country-driven process; it is often an integral and fundamental component of all activities related to sustainable development and climate change. Capacity building is about equipping people and organizations with the tools and resources necessary to effectively develop their own capacity to manage their core functions, and achieve their own mission.	Included.
33090	15	55	19			"The IPCC obliges".. This is simply false. The IPCC does not oblidge anyone to do anything, rather it provides policy relevant information. Please rephrase this urgently.	Deleted

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
19574	15	55	2	55	2	In the discussion of leadership I would refer also to the case with the Canadian Inuits and the Organisation of American States - OAS, with a non-scholarly description here:http://blogs.unimelb.edu.au/peel_climatechange/2010/05/24/inuit-petition-to-the-inter-american-commission-on-human-rights/	Not included.
19553	15	55	21	55	23	True, however, capacity building is not just about participating effectively in the UNFCCC negotiations; instead it is much broader than that. Capacity building is about institutional policies that affect broad implementation. Country-driven capacity building is a key to the effective implementation of the UNFCCC by all Parties, and essential for many developing countries to enhance mitigation and adaptation actions. Capacity building depends on national and local circumstances and the existing institutional frameworks.	addressed in new structure.
41949	15	55	25	55	29	Although it is good to point out the opportunities, it would be helpful to point out who can take advantage of these opportunities, and who loses from them. There is a growing social science literature on the latter.	Now described as a challenge.
19554	15	55	27			NAMAs stand for Nationally Appropriate Mitigation Actions, not Agencies. This needs to be amended.	Adressed.
19556	15	55	29			It is unclear why only renewable energy was mentioned under commercial opportunities.	Rewritten, no longer relevent
19550	15	55	3	55	7	This is not an objective comment and thus is inappropriate for this chapter.	Deleted
19557	15	55	30	55	38	These lines refer to a UNFCCC document (FCCC/SBI/2011/L.37) that is not a Decision, but instead a recommended draft decision that was never adopted in Durban. Suggest instead that this section refer to the creation of the Durban Forum on Capacity-building (see: FCCC/CP/2011/9/Add. 1), which in essence serves as a dialogue among all stakeholders involved in capacity-building. The Durban Forum provides a tool to improve the monitoring and review of the effectiveness of capacity-building within the international climate change regime. It has been designed as a place where representatives from Parties, UN organizations, intergovernmental and non-governmental organizations, research, academia and the private sector can share ideas, experiences, lessons learned and good practices on implementing capacity-building activities in developing countries. The first meeting of the Durban Forum on Capacity Building is summarized in this report (see: FCCC/SBI/2012/20).	Addressed.
19551	15	55	7	55	8	While climate change can severely derail poverty allieviation in Africa countries, one could argue that it is much more widespread, including parts of South Asia. (Source: The Poverty Impacts of Climate Change, World Bank, March 2011, http://siteresources.worldbank.org/EXTPREMNET/Resources/EP51_v4.pdf)	Noted.
26082	15	55	11	55	23	In terms of evaluation, the paragraph may be add step-by-step approach, and PDCA(plan-do-check-act) cycle, which allow developing countries and communities develop their capacity by gradual improvement with feedbacks, if there is a long-term and short term strategies or planning.	Not included.
19544	15	55	11			This section could benefit by including a reference to the enhanced capacity building support in recent years under the UNFCCC and related importance of monitoring and evaluation of capacity building efforts, which has been a topic of great discussion in recent years in the UNFCCC negotiations. One might want to reference the role that evaluation can play as a powerful learning tool as well as a teaching method (e.g., identifying lessons learned, improving the quality of capacity building efforts, assisting in understanding performance).	Not included.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
26523	15	55	23			Create a new paragraph: "Building private sector capacity of workers and employers and engaging in Social Dialogue. A number of studies indicate that good management, trained workers and clean manufacturing increase energy efficiency while reducing CO2 emissions. Substantive carbon reductions can be achieved at zero or nevative cost through improved workplace practices, optimized processes and behavioural changes in production. Often gains can be obtained without any capital investments but investing into human resource and skills development. Dedicated enterprise support programs, specialized training of workers and social dialogue among unions and employers have shown measurable emission reductions at enterprise level as well as have been conducive in enabling aggreements on many national climate policies. Source: ILO, 2012: Social dialogue for sustainable development, A review of national and regional experiences; Mazur, E.; Green Transformation of Small Businesses, OECD Working Paper No 47.; Bloom, N., Genakos C., Martin, R., Sadun, R. 2008: MODERN MANAGEMENT: GOOD FOR THE ENVIRONMENT OR JUST HOT AIR? Working Paper 14394, NATIONAL BUREAU OF ECONOMIC RESEARCH, Cambridge, MA 02138.	Partly included and peer reviewed ref found.
19545	15	55	24			This section should make reference to recent and pertinent discussions underway in the UNFCCC process dealing with capacity building. For example, due to the cross-cutting nature of capacity building and the importance of sharing experiences, the Conference of the Parties under the UNFCCC requested the Subsidiary Body for Implementation to organize an annual in-session Durban Forum for in-depth discussion on capacity-building following COP-17 (see: FCCC/CP/2011/9/Add.1). The Durban Forum has been designed as a place where representatives from Parties, UN organizations, intergovernmental and non-governmental organizations, research, academia and the private sector can share ideas, experiences, lessons learned and good practices on implementing capacity-building activities in developing countries. Given the role and participation by the private sector, the Durban Forum should be referenced in this section.	Included.
28175	15	55				The argumentation in this section is not really clear / why it is at this position.	Salvaged ref.
26083	15	55	39	56	313	It is important to speak to energy resources, but why only energy? There are many important capacity-buidling related items in other sector such as forest, or in other functional topic such as MRV. I have no objection about the content itself though..	Different structure that is not sector specific.
19555	15	55	25	55	29	This section could also mention the importance of low-carbon development strategies or plans.	Mentioned.
19558	15	56	1	56	13	It is not clear if this argument belongs in section 15.10.4.	noted.
41937	15	56	15	56	16	Governments have started to plan…'	not clear.
41950	15	56	16	56	16	This is a sentence that may be worth phrasing carefully and consistently across IPCC chapters and WGs. The point here is that regardless of international, national and local efforts at climate mitigation, climate change is occurring and will occur in the coming decades due to the residency times of greenhouse gases in the atmosphere and thermal inertia of oceans. This means that adaptations will be necessary both now and in the future, but that they should be consistent with mitigation efforts because the more the climate changes, the greater adaptations will be required.	This has been recognized in the new text.
33091	15	56	16	56	42	These paragraphs could be reduced to clearly reference WG II and the key findings from their SPM. It's crucial that the findings are consistent.	references added.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
30265	15	56	19	56	32	The points about the net health benefits are based on studies largely from the UK. There has been some work in the US on health-related costs of climate change-related events, from six types of events projected to increase in extent, frequency, intensity or duration as climate change continues (Knowlton et al. 2011). This work estimated 14 to 40 billion $USD in health-related costs, some portion of which could be avoided by preparedness and adaptation policies, to be balanced against the costs of instituting those same policies. While other parallel US-based studies to evaluate such adaptation costs are not available, it seems worthwhile to note the substantial cost estimates. At least one related study suggests US populations may not experience a net benefit from rising temperatures, because reductions in cold-related deaths are not likely to outweigh increases in heat-related mortality among a population largely acclimatized to cold, but not to rising heat (Medina-Ramon and Schwartz 2007). [Two additional citations to consider: Knowlton K, Rotkin-Ellman M, Geballe L, Max W, Solomon GM. 2011. Six climate change-related events in the United States accounted for about $14 billion in lost lives and health costs. Health Affairs 30(11):2167-2176. doi:10.1377/hlthaff.2011.0229; and: Medina-Ramon M, Schwartz J. 2007. Temperature, temperature extremes, and mortality: a study of acclimatization and effect modification in 50 US cities. Occup Environ Med 64(12):827-833.]	this has been revised.
41951	15	56	19	56	32	It is a bit confusing as to whether this paragraph is discussing the costs of adaptation policies, or of climate impacts. If it is adaptation costs, cross-references could be made to chapter 17 in WGII. More references would in any case be useful. Perhaps the key message here is that the less mitigation, the more adaptation that will be necessary, but that there is considerable uncertainty about the total costs of adaptation under different scenarios of climate change.	this has been completely revised.
41952	15	56	33	56	36	There is abundant evidence that food-insecure regions are already adapting, and will need to adapt more if food security is the goal. Adaptations will be triggered not just by biodiversity changes, but by changes in water availability and crop yields.	Noted.
41953	15	56	36	56	37	"Adaptations in wealthier countries are likely to be easier." This is an overgeneralization, when one looks at the literature. It may be easier for some locations and groups to adapt, particularly if financial resources are easily available. But looking at adaptation as a social and political process, it does not seem to be necessarily easier, as exemplified in coastal adaptations in the US (see Moser and Boykoff 2013 on "Successful Adaptation to Climate Change" and Ford and Ford 2012 on Adaptation in Developed Countries)	Agreed. This has been addressed.
41954	15	56	39	56	40	Please explain and reference the adverse side effects for human health. It is an important point that the consequences of adaptation will also have costs-- water desalinization plants could be a good example.	Noted.
26607	15	56	4			ADD or the role of policies in getting there or actors' acceptability and capacity at using these new technologies.	noted.
41955	15	56	43	57	2	The important point in this paragraph is that adapation is not simply about technical interventions and institutional reforms; it is a social process that is occurring in the context of many other changes. Changes in climate variability and extreme events increase disaster risk, which calls for investments in both disaster risk reduction and adaptation. This adds to the costs of adaptation, and again points to the links between mitigation and adaptation.	Social process has been recognized in the new draft.
33093	15	56				This section seems very disconnected from Working Group II. It would be useful to bring in Cas from WG II to ensure consistency and a balanced assessment, referencing their text accordingly.	Accepted. Done.
24964	15	56	15	56	18	Suggested amendment to make more clear: 'Despite international mitigation efforts, some climate change has to be anticipated. Governments have started to plan and implement policies aimed at tackling phenomena that are likely to take place or do take place already (Aaheim et al., 2008).'	Noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
29572	15	56	15	57	2	The information here is on only very selective parts of the world and it may therefore not be representative.	this section has been rewritten. Focus has been shifted away from impacts.
24965	15	56	19	56	20	Suggested amended first sentence of paragraph to make clearer: 'While climate change adaptation policies can be expensive, the costs of not responding to the causes of climate change will result in the cost of adaptation being even greater (Osberghaus and Reis 2010).'	noted.
24966	15	56	37	56	42	The claims made regarding water supply come across as overstating the issue. Further, the statements do not reflect that there are many factors involved. The actual issue behind the statements is the modelling that with increased installation of rainwater tanks in urban areas combined with climate change impacts, there is the risk of mosquito-borne dengue fever spread. However, the statements made are very general and could be misinterpreted or result in over emphasis. It is suggested that the following changes be made to the wording: "In some regions, such as Australia, authorities and households are actively investing in measures to maximise available water in response to significant periods of very low rainfall. While there may be the potential for future risks to human health from mosquito-borne disease, especially under future climate change, such risks are yet to be quantified and are often addressed through standards and information." Citation: National Water Commission - Guidelines for Rainwater Tanks, http://www.nwc.gov.au/__data/assets/pdf_file/0016/10753/RAINWATER_handbooknwc_logo.pdf, or Guidance on the use of rainwater tanks, Dept. of Health and Ageing, http://www.health.gov.au/internet/main/publishing.nsf/Content/DD676FA1241CDD0DCA25787000076BCD/$File/enhealth-raintank.pdf .	This has been revised.
24967	15	56	43	56	46	Suggested amendment to start of paragraph to make clearer: "Analysts emphasize that adaptation is not just a technical or scientific issue. It is a challenge for risk assessment capacity, changing human behaviour, and enhancing institutions while also balancing the need for strong mitigation action (O'Brien, 16:07:34; Agrawal et al., 2008; van Aalst et al., 2008; Adger et al., 2008; Mertz et al., 2009; Costello et al., 2009; Vignola et al.,)"	This has been noted.
24969	15	57	10	57	10	The statement that mitigative and adaptive capacities are fundamentally disjointed is not substantiated. Suggest it should be deleted	the issue of linkage has been completely rewritten.
41957	15	57	17	57	17	This seems to be a very specific sub-heading for a larger section that is quite general. Perhaps the discussion could focus on "win-win" strategies that meet the goals of both mitigation and adaptation (e.g., those that are considered to be sustainable adaptations).	noted.
38706	15	57	19	57	26	This is weak as a separate section. The authors should take into account significant other literature on linkages and local action…see e.g. regional chapters of WG2 as example.	this has been completely revamped.
41958	15	57	21	57	22	It is not clear why governments need to undertake them independently. What prevents a holistic approach to climate change responses? Many countries have drafted National Adaptation Programmes of Action, and more and more countries are "mainstreaming" adaptation into all sectors and levels of government.	noted. NAPs have been mentioned in the revised text.
41939	15	57	27	57	37	there are a number of approaches to assessing the potential effectiveness of adaptation policies; an important aspect is inclusion of potential future risk, which is the effect of future uncertainty on the achievement of objectives (see WG2, Chapter 2); there are opportunities for applying decision support tools and participatory approaches in the assessment of effectiveness of policy options on achieving future objectives, so this discussion should not be confined only to one approach	Noted - this is revised.
41959	15	57	27	57	37	Why does the complexity call for multi-objective analysis? This seems to approach the issue as a technical, economic issue. The relationship between mitigation and adaptation seems to call for an approach that can consider both of them together as part of a larger response to climate change, rather than as separate and unrelated issues.	this has been rewritten.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38707	15	57	27	57	37	There is a rich literature on decision making for climate related decisions, in multimetric analysis or uncertainty. This small section does not do justice to it. The text should be revised accordingly and, at a minimum, discuss the most recent reviews, as well as, say, the NRC Informing an Effective Repsonse to Climate Change report of the America's Climate Choices suite of reports.	Noted.
41938	15	57	3	57	16	there is also the difference between 'lifestyle' emissions and 'survival' emissions (sometimes described as 'adaptive emissions'), for which there is no mechanism within mitigation policy to treat them differently; for example, carbon emissions to support coastal zone defense could be accounted for differently from automobile emissions	noted.
41956	15	57	4	57	16	This paragraph does not make much sense, and I get the impression that it is talking about policies and practices rather than capacities. A paper by Tompkins and Adger (2003) http://startinternational.org/library/archive/files/socresponsecapacityclimatechangepolicy_6a687bc9ef.pdf discusses some of the theoretical similarities and differences in mitigation and adaptation capacities.	noted.
41960	15	57	40	57	40	The goals include social needs as well. This topic is discussed extensively in Chapter 20 of WGII, which considers adaptation, mitigation, and sustainable development.	noted. Thank you.
33092	15	57				This section seems to imply that mitigation efforts at a local level are useless and even at the global level are prone to serious problems. Please ensure that policy relevant but neutral language is applied, and that the text in this section is an assessment.	this messaging has been addressed.
24968	15	57	3	57	16	This section does not reflect the recent changes in acknowledging the fundamental relationship between mitigation and adaptation policy development and discourse. Further, it reads as being overly negative on the link between mitigation and adaptation. A fundamental principle of mitigation policy is that it does not result in perverse outcomes for adaptation responses. Similarly, a fundamental principle of adaptation policy is not to result in perverse outcomes for mitigation responses. Suggested rewording: "Mitigation and adaptation polices are fundamentally linked even though the mechanisms used may differ. The link between the two policy agendas is that the response of either mitigation or adaptation should not result in a perverse outcome for achieving the policy outcome of the other. There are tendencies to argue that mitigation and adaptation policies are related to each other (Smith and Olesen, 2010). This, however, is a controversial issue (Hamin and Gurran, 2009). For example, effective climate change mitigation needs to be taken at the global level, which makes the outcome largely independent of individual mitigation efforts. Moreover, well-known economic phenomena such as "carbon leakage" can weaken the results of these efforts and may even make unilateral abatement economically detrimental unless a mechanism is adopted to prevent unwanted effects. By comparison, adaptation responses tend to be locally focused with locally derived benefits. Second, future emissions growth is linked to economic growth in low and medium economies as well as the emerging super economies of Brazil, China and India. At the same time, these economies are projected to be most vulnerable to climate change impacts and have a low adaptive capacity."	noted. This has been completely revised.
24970	15	57	17	57	26	Suggest delete this section, as the topic is expected to be covered in the Adaptation Working Group report.	Care has been taken to restrict the focus to linkages. References are made to WG2 where necessary

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24971	15	57	28	57	37	This section is under-developed. Multi-objective analyses are not carried out with respect to adaptation question only. Multi-objective analyses are also used by policy makers to assess mitigation options, especially where it may be difficult to exactly quantify the GHG benefits in the short term. Suggested amendment: "Multi-criteria policy analysis is a useful strategy for developing measures that are both mitigative and adaptive. As multi-criteria policy analysis requires a range of assessment variables to be selected, it means that mitigation and low carbon options can be included as a consideration, either negotiable or non-negotiable (UNFCCC 2011). It also allows for uncertainty to be factored in." Suggested citation: United Nations Framework Convention on Climate Change (2011) Assessing the costs and benefits of adaptation options: An overview of approaches, The Nairobi Work Programme on impacts, vulnerability and adaptation to climate change, http://ynccf.net/pdf/Adaptation/Assessingthecostsandbenefitsofadaptation.pdf	his has been rewritten.
24972	15	57	38	57	46	Suggest delete this section, as this issue will be addressed through the Adaptation Working Group.	Care has been taken to restrict the focus to linkages. References are made to WG2 where necessary
27385	15	58				Please, include the National Climate Change Fund (http://www.bndes.gov.br/SiteBNDES/bndes/bndes_en/Institucional/Social_and_Environmental_Responsibility/climate_fund_program.html)	Table removed.
33094	15	58				This table is unnecessary and could be replaced with a simple mention of these sources of climate finance. Dissolve to save space.	Table removed.
28177	15	58				The choice of funds in the table (and thus subsequent discussion) is very random and not understandable - either need to add the main funds (to be copied from CPI Report "The Landscape of Climate Finance 2012", Buchner et al, Appendix E - Details on Climate Funds, page 82/83) or clarify why certain funds are chosen.	Table removed.
41940	15	58	1	58	6	land use change emerges both from planning and from governance; urban sprawl and monoculture are the results of governance, not just of planning. An important question therefore concerns the role of information (from climate change research) in planning, decision making and governance. For science to enable better decision making, including development decisions that would not increase emissions or exacerbate vulnerabilities, can we say anything about the role of information, and information transfer, from research to governance? Otherwise, what is the point of publishing IPCC assessment reports? As a capacity issue, there should be a statement about how information could build capacity to enable better decisions about land use. WG2 Ch2 discusses the role of boundary organizations in facilitating knowledge transfer from research to decision making bodies.	noted.
28176	15	58	14	58	15	What are other key areas of interventions?	this has been rewritten
26768	15	58	17	58	18	“Often times” is incorrect. “National and sub-national efforts to finance climate change have often had an explicit link to international processes or support”. this sentence	text revised.
41961	15	58	2	58	2	The prior section argued that they are not independent. Land use planning is one area where they come together, but also energy planning, as energy is essential to adaptation.	Noted- this section has been revised.
38708	15	58	2	58	6	A much larger literature should be included.	Noted. Text revised.
20555	15	58	21			To say "this is not meant to be an exhaustive list" sounds strange, as there are several dozens of funds and only four are mentioned here. Perhaps change to "This is just to give a few examples…"	Table removed.
20556	15	58	24			Replace Ghana Fund (is not a climate fund, and I'm not sure it is in operation). I suggest replacing it with the Indonesian Climate Change Trust Fund. Operation: 2010; Administration: Government of Indonesia; Focus Area: Mitigation and Adaptation; Source: domestic budget; International support	Table removed.
20557	15	58	29	29	1	Change "Some of these institutions" to "Some national climate funds"	Table removed.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
24973	15	58	1	58	6	Suggest the inclusions of land use planning in this chapter and particularly this section are important and should be kept in the event of the chapter being shortened.	Land use planning has been mentioned; Also seen provision of public goods by government section
24974	15	58	2	58	6	Suggest delete this section, as the Issue is expected to be addressed through the Adaptation Working Group report.	Care has been taken to restrict the focus to linkages. References are made to WG2 where necessary
28178	15	58				There is a lack of mentioning National Development Banks given the focus on regional/national actors - this needs to be added as one of the recent developments which show the significance of national actors. See for example Smallridge, D., Buchner, B., Trabacchi, C., Netto, M., Lorenzo, J.J.G., and L. Serra (2012), "The Role of National Development Banks in Intermediating International Climate Finance to Scale Up Private Sector Investments", IDB Discussion Paper No. IDB-DP-249.	this has been moved to Chapter 16 for a full discussion
20294	15	58	7	59	16	It might be worth mentioning that cities in particular face challenges in receiving financing through the existing CDM mechanism. Several case studies are presented in: Clapp et al (2010), " Taking Stock of Cities' Experience with CDM and JI", OECD Publishing, http://www.oecd-ilibrary.org/environment/cities-and-carbon-market-finance_5km4hv5p1vr7-en	Noted.
20560	15	59	10			"fragmentation and proliferation, particularly as regards identifying what counts as being climate relevant."	Noted
20561	15	59	11			"Some preliminary evidence shows that what is reported to the DAC as climate change related aid may in fact have nothing to do with mitigation or adaptation."	noted
20562	15	59	13	59	14	"In addition, segmentation exists within governments with regards to responding to climate change. Ensuring coherence among national institutions with climate change mandates and Cabinet entities such as..."	noted
20558	15	59	2			Flynn, add 2011	accepted. Added
28180	15	59	20	59	26	The paragraph talks too negatively about mainstreaming climate change into development planning. Although there are challenges, this still is the way to go, if a transformation is supposed to happen, led by countries where emission increases are highest.	This has been revised.
28179	15	59	3	59		What is meant by "such national funding entities"?	Any agency responsible for coordinating, accessing, disbursing or regulating climate related finance. Please see Ch16 for a more detailed discussion.
28181	15	59	38	59	45	Sudden switch to 'carbon finance' which is a much narrower term than climate finance - needs to be changed as issues hold more generally.	Agreed. Changed.
20559	15	59	4			Replace "mitigation" with "climate-related"	Noted.
29573	15	59	38	59	45	In this place as well, the potential financing through the Green Climate Fund could be mentioned.	This is left for Ch16
28182	15	59		59		The three issues outlined here do not correspond to policy changes - language needs to be adapted.	Noted- this section has been revised.
38611	15	6	10	6	11	Instead of stating "...hampered by barriers," the text should just state that information is costly, and often asymmetric, both of which prevent individuals and firms from the optimal consumption and provision of information.	Noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
25786	15	6	18	6	24	The part from line22 to line23 should be deleted completely because regulatory threats are not necessary for voluntary agreements. Basically voluntary agreement is based on a spirit of self-commitment, never depending on other concerns such as regulatory threats. "Voluntary agreement" is an effective method to improve energy efficiency and reduce GHG emissions, as described in the section 15.5.7.4. There are successful examples of "voluntary target scheme" in the world. Each industry in Japan has voluntary target and the voluntary target scheme has played a big role, as described in (Yamaguchi, 2012, page35 and 154), (Manuel, 2010, page 6 and 13), and (Yamaguchi, 2010, abstract). In addition, there is also a successful example of "voluntary target scheme" in Netherlands, as shown in (Martijin, 2002, page162). These literatures are listed in the No22 line of this table. The other part of this paragraph should be kept in the final version report.	This has been revised. The literature does find that regulatory threat does help achieving voluntary agreements.
20855	15	6	22	6	24	We Japanese countries are contributing GHG emission reduction not as avoiding "regulatory threats" but as cooperate social responsibility. "Regulatory threats" as motivation factor should be deleted.	There is considerable diversity in motivations for voluntary actions.
23126	15	6	23	6	24	Replace "On the other … framework" by "On the other hand, environmental effectiveness of voluntary agreements seems to have been limited".	Text revised.
28134	15	6	23	6	24	What is meant by "environmental impact" in this case? This last sentence seems to devaluate the whole paragraph.	Text revised.
31154	15	6	26			The statement 'Price instruments are insufficient to stimulate sufficient investment in new technologies' is not substantiated. It appears that price increases in fuel in the 1970s stimulated significant technology development in fuel efficiency.	The emphasis is on 'sufficient' or not. Text revised nonetheless.
38612	15	6	26	6	36	Elaborate. Need more robust discussion of market failures. IP is one way to address. Need to clarify what the evidence/agreement refers to exactly. May need to split paragraph to assign different confidence levels. The text should address why price instruments are insufficient to stimulate investment in new technologies.	Noted- this section has been revamped.
23125	15	6	3	6	3	Add after "medium evidence": "Increasingly, grandfathering has been replaced by auctioning".	Noted.
41942	15	6	30	6	33	The failure of the market to protect intellectual property rights is a problem from a particular paradigm, but it would be good to mention other approaches to property rights (such as open source approaches), which may offer other benefits and drawbacks for pricing policies.	This section has been revised.
32293	15	6	30	31		It should be clearly written that technology development and transfer will be slow if IPR is not properly protected. The current sentence is not clear on this point.	This is debated in the literature and is reflected in the text.
28135	15	6	30		32	The market failure on market for intellectual property rights could be described in one sentence.	This section has been revised.
38610	15	6	4	6	4	Revise, as not all policies are implemented to address climate, but may impact climate.	ES revised.
24943	15	6	5	6	7	Unclear whether this is referring to compensation between governments and business, governments and households, or between national governments, and on what basis this compensation is necessary.	Revised.
26514	15	6	14			…after "level" include: "Removing social capital and human resource barriers could catalyse deployment and investments into renewable energies. Targeted eduaction, technical and vocational skills and management training would increase investment, decrease overall cost and increase public acceptance of climate policy while stimulating demand.	noted.
26515	15	6	34			…after "transfer" include: "Thereby, technology policy hinges on investment into education, human resources and knowledge generation as a source of innovation and requires investments into employment and enterprise development for market uptake and knowledge transfer."	Noted.
26516	15	6	38			…after "measure," include: "social capital and human resource building"	Noted. This has been taken into account in the revisions.
26517	15	6	44			..after "regulations" include: "Without education, training and an enabling environment for renewable energy business there may be gaps in enterprises, skilled workers, informed consumers and managers."	enabling enviroment has been discussed.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
28977	15	6	26	6	36	I expected the “second market failure” discussed to be about insufficient long term finance for risk based on the first market failure (lack of internalization of damages from greenhouse gases), not about the market failure in IP protection, as IP is protected increasingly (and often too much from a social welfare approach) in many places.	this has been revised.
38709	15	60	1	60	3	Price is but one element of a portfolio of policies and the literature does not support that price alone is sufficient and necessary.	This has been addressed. Please see regulatory section.
38710	15	60	3	60	16	This section could be improved if it started with the interactions of national and subnational policies, within international policy environment? Then discuss the key issues for national/subnational, which may include some of these elements, but also others just as jurisdictional challenges, understanding the complexities of policy portfolio impacts across jurisdictions, etc.	This section has been rewritten. International policy environment is left for Ch13
35334	15	61				It is suggested to change “Country” in the second column in the second table to “Country or Region”.	the category used is UN member states.
27342	15	62	24			Reference to Brazilian legislation does not refer to an official source. The link "http://www.preventionweb.net/files/12488_BrazilNational policyEN.pdf" should be replaced by (http://www.planalto.gov.br/ccivil_03/_Ato2007-2010/2009/Lei/L12187.htm); (http://www.mct.gov.br/index.php/content/view/315843/Politica_Nacional_sobre_Mudanca_do_Clima.html); (http://www.mma.gov.br/clima/politica-nacional-sobre-mudanca-do-clima)	Noted.
26608	15	62	31			careful, Canada has repealed its climate act in 2012	Noted.
26609	15	63	60			FALSE France has indeed adopted EU emissions reduction targets by 20% but it is the only country to have created legally binding climate and energy plans, as part of the Environmental Code.	Noted.
19430	15	66		66		Palestine(as a source of information, kindly find the link to the National Adaptaation Strategy: http://www.undp.ps/en/newsroom/publications/pdf/other/climatechange.pdf	Noted.
24206	15	68				Since the second column of Figure 15.1 is country, Taiwan is regarded as an independent country. Suggest to change the title of the second column into "country and region"	This figure has been removed
19987	15	68				Since the second column of Figure 15.1 is country, Taiwan is regarded as an independent country. Suggest to change the title of the second column into "country and region"	This figure has been replaced.
35335	15	68				No.166 Taiwan should be changed to “Taiwan, POC”.	Noted.
28136	15	7	1	7	4	Need to add one sentence to also say that ETS might significantly reduce emissions, if the design/incentives are right.	ES has been revised.
41943	15	7	16	7	20	Mitigation and adaptation can also be closely related. If adaptations lead to increased energy for cooling, for example, it could counteract mitigation measures. If mitigation focuses on changes in land use, it may make adaptation of livelihoods difficult. There are many examples in the literature, particularly on sustainable adaptation.	This example has been noted.
31155	15	7	24	7	27	Given that agriculture was hardly mentioned throughout the chapter as most of the focus was on energy, the reference to monoculture as a poor land use planning process example in the executive summary is not really supported and should either be nuanced or backed up by a significant body of research.	This has been removed.
38613	15	7	29	7	30	As written, the text implies that developed countries must do this. Rephrase.	noted.
28138	15	7	29	7	30	The primary motivation for "financing CLIMATE adaption and mitigation" is not "welfare and equity". These objectives could also be achieved by traditional ODA. Therefore, other, additional goals should be mentioned, e.g. "transformational change".	Noted- ES text revised.
28137	15	7	29	7	31	Investment is not only needed because of welfare and equity, but because of the overall goal of addressing climate change and the fact that there are more opportunities in emerging economies due to development path	Agreed- this has been noted.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
38614	15	7	30	7	35	The finding speaks to int'l climate financing only and mechanisms in recipeint countries vs the general need for financing, PPPs, etc… this section and the summary material should also include info on national funding programs (eg, BNDES)	Discussion of funding entities has been carried over to Chapter 16.
26518	15	7	15			Change title from "Capacity buidling" to "Capacity building of social and human capital, education and skills"	This is plenary agreed language.
26519	15	7	20			…after "sources" include: "International studies indicate that human resources and social capital make up to 59% of wealth in developing countries and up to 80% in developed countries. Comparted to physical capital (technology) and natural capital it is the single largest contributor to economic growth. Accordingly, climate and technology policy that aims at stimulating clean energy growth requires investment into social and human capital in the field of renewable energy." Source: World Bank 2011, The changing wealth of nations, measuring sustainable development in the new millennium.	Noted.
25105	15	70	1	97	11	Please make sure that all references are written in English. And if not, some note should be added showing such literatures are written in, for example, French, German, Japanese, Chinese etc.	noted.
41936	15	70	5	70	7	need complete citation	Noted.
20365	15	8	11	8	13	These "other" issues are not integrated in a structured perspective on policies. This makes these issues seem residual, coming on top of what is felt to be the core of the issue dealt in the remainder of the chapter. It can be argued that these issues are part of the structuring of an enabling environment for policy effectiveness and efficiency. For such a perpsective see chap 11 SRREN, including a substantial bidy of pr literature supporting this view.	revised
38615	15	8	15	8	15	The text should indicate that "institutions" can be both public and private.	The term institutions is used in the sense of the glossary definition pertaining to the rules of the game. This is distinct from organizations, which may be public or private.
21352	15	8	29	8	29	Insert: An example of how to avoid lock-in and draw attention to the wider questions of political economy is the emerging discourse on the clean energy economy (Byrne, Wang, Taminiau, & Mach, forthcoming) Byrne, J., Wang, Y.-D., Taminiau, J., & Mach, L. (2013). The Promise of the Green Energy Economy. In J. Byrne, & Y-D Wang, Secure and Green Economies. New Brunswick, New Jersey: Transaction Publisher. (forthcoming)	Added 15.2.1
22223	15	8	33	10	6	The methodology used to produce this figure should be rigorous and transparent (see related comment on annex A) as it matters for interpreting emission trends and drivers described in Chapters 5, 6 and 13. Scientific experts must discuss whether they want to take into account policies for renewable energy and energy efficiency in this figure (currently not integrated although reported by IEA, UNEP, literature in general as effective mitigation policies) in an integrated mannger or separately. If not, they have to provide a methodological justification.	Details on methodology added. 15.2.2
26753	15	8	36	8	38	The term “legally binding” needs to be more clearly defined. Is the climate strategy legally binding under international law or does this refer to legally binding provisions for actors within the particular nation state? (e.g. entities liable to pay a carbon tax or purchase emissions allowances under an emissions trading scheme).	Point clarified. 15.2.2
38616	15	8	36	8	37	Clarify the distinction between "legally binding" and "political non-binding"	clarified. 15.2.2
22222	15	8	1	14	3	The introduction could make much more of the increasing multi-level nature of climate governance worldwide as a unifying analytical concept.	Partially accepted. The introduction now mentions that the consequences of the multi-level nature of climate governance is discussed in Sections 15.7 and 15.8.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
33074	15	8				The key findings outlined in the conclusions sub-section cannot be clearly located by the reader in the preceeding sub-sections, as topics are intermixed among headings. It may be useful to restructure this section along the following lines: 15.2.1 Why Institutions and Governance Matters 15.2.2 Trends in national climate change mitigation actions (including drivers) 15.2.3 Sub-national and municipal actions and institutional interplay 15.2.4 Addressing climate change mitigation by sector 15.2.5 Institutional requirements for overarching climate change mitigation policies 15.2.6 Conclusion	Re-written substantially along these lines
20293	15	8	14	13	37	It would be useful to cite the growing emergence of low-emission development strategies (LEDS) in several countries (e.g. UK, Mexico, etc.), which integrates both climate policy planning and economic development strategies. The LEDS concept is supported by a wide range of developed and developing countries alike in the UNFCCC negotiations, and the US e.g. is providing financial support to 30 countries to work on these planning tools. Several examples are given in Clapp et al (2010), "Low -Emission Development Strategies (LEDS): Technical, Institutional and Policy Lessons", OECD/IEA Publishing, http://www.oecd.org/environment/cc/46553489.pdf.	For 15.2 LEDS have pub
32971	15	8		8		A crisp, quick 1-line definition of institutions & governenace would be useful, or as an alternative a reference to the glossary if these terms are covered there.	ref to glossary
32218	15	8	15	8	31	The section on why institutions and governance matter is only partly satisfactory because it does not acknowledge that institutions and governance are also inherently political in the sense that climate mitigation policy in several key countries (notably the US, Canada and Australia) have been strongly characterized and influenced by political partisanship. The concept of political contestation around climate mitigation policy is only partly encapsulated in the idea of policy paradigms because this implies that political disagreements are predominantly, if not exclusively, struggles between ideas, as opposed to being struggles to gain political/electoral advantage. However, the use of climate change as an electioneering weapon is strongly evident in Australia and the US, among others, whereas its removal as an arena of party politics in the UK and Germany, for instance, has enabled these countries to make more ambitious advances in climate mitigation policy. AR5 clearly needs to avoid political statements but a thorough and balanced analysis should still make apparent the importance of politics and the fact that governance and institutions are not politically neutral. I recommend insertion of the following or similar text. 'It should also be recognized that climate mitigation policy has become a strongly divisive issue between political parties in several countries. Such disputes may be based on ideological differences but may also stem from climate change being utilized to gain electoral or other political advantages. Evidence suggests that the political nature of climate governance can exert a significant influence on climate governance, although further research is needed to provide strong conclusions about the nature of these effects (Carter, 2009; Giddens, 2011).' The references to support this argument would be: Carter, N. (2008) Combating climate change in the UK: Challenges and obstacles Political Quarterly, 79 (2), 194-205; and Giddens, A. (2011) The Politics of Climate Change, second edition, Cambridge: Polity Press.	New section 15.2.6 partially addresses this point. Explicit point about use of climate change as electioneering issue is not addressed, but the citations provided do not provide a sufficient basis to make this point.
22466	15	8	15			Institutions also matter because the formal rules of decision making, in particular those that create veto points at particular locations in the decision making process, determine who can block new policies if they oppose them and therefore influences the relative power of political actors over the content of climate policies. For an illustration of this dynamic in action see Harrison, K. (2012). A tale of two taxes: The fate of environmental tax reform in Canada. Review of Policy Research, 29(3), 385–409.	Inserted. 15.2.1

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
32678	15	8	16	8	17	"Different countries have different policy paradigms." True, but different actors within countries may adhere to very different paradigms. Perhaps better to say "Different policy paradigms largely govern/prevail in different countries… These paradigms specify..."	Revised
32679	15	8	21	8	24	In addition to setting the broad policy context and "coloring" the way problems are percieved, institutions also shape actor interests (Steinmo et al. 1992). The classic argument is from Pierson (2001) on the New politics of the welfare state, in which he points out that institutions create their own core constituencies with a stake in certain policy trajectories, therefore creating the incentives for lock-in. This is implicit in this paragraph but making it explicit between the sentences on line 24 would, I think, flesh out the logic a bit more, as well as provide the appropriate references. Steinmo, Sven, Kathleen Thelen and Frank Longstreth. 1992. Structuring Politics: Historical Institutionalism in Comparative Analysis. New York: Cambridge University Press. Pierson, Paul. 2001. The new politics of the welfare state. New York: Oxford University Press.	References added and text modified. 15.2.1
22467	15	8				To inform your deliberations here I shall email separately a very recent paper that sets out a rigorous comparison of the strength of climate policies (defined as actions that definitely have an effect on emissions) in the six biggest emitters: China, the US, the EU, Japan, India and Russia. The policies compared comprise carbon taxes, emissions trading, feed-in tariffs, quota schemes, and emissions standards for power stations and for motor cars. Among other things the results demonstrate that there is no longer a significant gap between the policies of developed and developing countries. Compston, Hugh, and Ian Bailey (2013), 'Comparing Climate Policies: The Strong Climate Policy Index', paper given to the Conference of the Political Studies Association, Cardiff, April 2013.	Paper is unpublished as yet. Also, this section is focused on institutional frameworks rather than explicit policies. There are a range of other unpublished studies on policies (GLOBE, Climate Tracker, Germanwatch etc.) and all would have to be cited to be even handed.
38618	15	9	11	9	11	If discussed later, why include here? It's a clear opportunity to shorten the text.	No change. This is a discussion of prevalence as an institutional approach. The later discussion is of substantive issues. The two are complementary. This section would be unbalanced without a brief discussion of prevalence of market approaches.
38619	15	9	14	9	14	The literature also covers differences in governance structures and many other reasons. The authors might review Stavins ; Columbia law review or other legal journals.	Article not found. Another article by Stavins in Chicago Journal of Inernational Law lists cap and trade programs and discusses linkage in these programs. Not directly relevant to the point being made.
30256	15	9	16			The final factor "and lobbying by fossil or energy-intense industry lobbies" would need a reference. For example: Sarasini 2013 , Institutional work and climate change: Corporate political action in the Swedish electricity industry, http://dx.doi.org/10.1016/j.enpol.2013.01.010	Added. 15.2.2
38620	15	9	20	9	21	What's cited here is gray literature. Are there peer reviewed pubs that cover this? The statement "ALL" COUNTRIES is not founded on strong literature base.	Agreed. "All countries" changed. Literature is from academic presses and credible sources.

Comment No	Chapter	From Page	From Line	To Page	To Line	Comment	Response
20662	15	9	24	9	24	Please add "E.g. in China, an important impetus of climate change mitigation actions in China is their impact on energy security, especially regarding the reduction of domestic oil demand. As the Chinese government aims at importing crude oil as little as possible, energy security concerns are increasing with growing net-oil imports. Climate change mitigation actions leading to a reduction of domestic oil consumption can reduce the energy security pressure (Oberheitmann, 2009)." Please cite as: Oberheitmann, A. (2009). China's energy security strategy and the regional environment - Assessment of economic growth and its environmental impact applying a dynamic welfare optimisation approach. Saarbrücken: VDM.	Agree. Cited in 15.2.4
28980	15	9	31	9	31	could add to sentence on India: "and for many more access is intermittant"	could not find reference to India in cited page and line.
38617	15	9	5	9	5	implication is "change in reducing GHGs at global level", specify.	could not find reference in cited page and line.
29299	15	9	8	9	22	There are several citations listed as forthcoming here and elsewhere, including whole paragraphs.	Much of the literature on climate policy is very recent, particularly the literature on the developing world. All this literature is expected to be published before the IPCC publication deadline. Including "forthcoming" articles was necessary in order to be current.
32219	15	9	16	9	16	After sentence ending energy-intense industry lobbies, I recommend adding a further reference to substantiate this final point. Bailey, I., MacGill, I., Passey, R. and Compston, H. (2012) The demise of the Australian Carbon Pollution Reduction Scheme: A Political Strategy Analysis, Environmental Politics, 31 (5), 691-711: doi:10.1080/09644016.2012.705066. This article provides detailed analysis of the effects of lobbying by industry-intensive industries to the forerunner of the current Australian emissions trading scheme, the Carbon Pollution Reduction Scheme.	Added 15.2.2
32220	15	9	21	9	21	Suggest addition of a footnote at the end of the sentence ending 'Rabe, 2009)'. A detailed review of the importance of co-benefits as a driving force for climate mitigation policies in China, India, Russia and Brazil is provided in: Bailey, I and Compston, H. (eds) 2012 Feeling the Heat: the politics of climate policy in rapidly industrialising countries, Basingstoke: Palgrave Macmillan.	Added to 15.2.4
19138	15	95	15		15	For the Tietenberg reference please add " 2nd edition"after the title. The first edition was 1985.	accepted. Thank you.
33951	15	97	4			Also add one refenece int the list of reference below. Yamaguchi M.(2012). Policies and Measures. In Climate Change Mitigation. A Balanced Approach to Climate Change. M.Yamaguchi.et.al. Springer Publishing Company, London, UK pp.129-159.	noted