IPCC Fourth Assessment Report

Expert Review of the First-Order Draft

Chapter 6

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-1	A	0	0			There is much focus on the situation in developed countries. The major threat however is de potential large increase in energy consumption in developing countries and countries in transition. (Harm Jeeninga, ECN)	Accepted. Discussion of revised approach to scenarios for TS and other points discussed wrt TS addresses this point, as well as addition of the point to the chapter.	??
6-2	A	0	0			Driving forces for energy consumption heavily depend on climate zones as well as disposable income. Therefore, the problem identification, technological measures as well as the policy framework need to be described by first making a distinction with respect to climate conditions as well as the state of delopment (developing countries, transition countries, developed countries). The chapter needs to be built around these driving forces, rather than to handle it in the current fragmented way. In some parts of the chapters, a frist attempt for this distinction has been made. (Harm Jeeninga, ECN)	Accepted. new tables on technology and policy summary and other new sections address this.	Diana wititl
6-3	A	0	0			Chapter 6 contains major imbalances with respect to the length of certain paragraphs in relationship to their relevance. Examples are the limited attention to security of supply (6.6.4) as well as hot water production (par. 6.4.6), where there is still too much attention for cooling (par. 6.6.4 and partly 6.6.5) (Harm Jeeninga, ECN)	Rejected. Security is domain of Ch 4, but reduced energy deamn thorugh better design does reduce supply. Comment with respect to cooling contradicts other comments which point out that cooling is the predominant thermal energy need in the majority of the developing countries – a large section of the world.	
6-4	A	0	0			Chapter 6 contains (extensive) desciptions about the problems, possible (technological) measures as well as policy schemes. However, it does not show hos the identified problems can be solver by the measures described using the right policy framework. It is now merely a description of individual topics without the required connection. In addition, please also make a clear distinction between measures that can be applied now and potential measures that can be applied somewhere in future (this specifically holds for section 6.4. (Harm Jeeninga, ECN)	**Partially accepted. We will make a distinctinction between currently available and future technologies. Technology assessment table will deal with this.**	**Danny will Technology byHiroshi.**
6-5	A	0	0			In editing, you want to be on guard for the word ton when used in conjunction with the capacity of cooling equipment. One ton of cooling capacity is that required to freeze 2000 pounds of ice in 24 hours (i.e., 288,000 Btu per day or 12,000 Btu per hour), or conversely, the heat absorbed in melting 2000 pounds of ice in one day. In	Accepted. Will use metric throughout.	Danny.

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						some reports, the spelling has been changed to the comparable metric unit of tonne, which is a larger unit, thereby introducing a numerical error of about 10%. (James Crawford, Trane/American Standard)		
6-6	A	0	0	0		There is also a need to have better distinction between the treatment of new and existing buildings (Paul Ashford, Calebgroup)	Accepted. Major section is added on renovation.	Danny
6-7	A	0	0	0		As a general point, the text is not very clear in its distinction between savings potentials and opportunities relating to the residential sector and those relating to the commercial sector. A more systematic treatment of each sector would be better. (Paul Ashford, Calebgroup)	Noted. Whereas the comment is warranted, there is no space in 35 pages for more segregate discussion.. If we can justify distinction in savings potentials, we will. Will be included to Table 6.1	Sev and Dl
6-8	A	0	0	0	0	A section is needed between 6.4 and 6.5 that discusses the opportunities to reduce the carbon footprint of buildings by selecting low-carbon building materials and systems. In preparing this section, it is important to note that the emissions related to heating and cooling are normally much larger than those embodied in building materials, so it is important that the thermal performance of structures not be compromised by selection of low-carbon building materials. For this reason, the list of references above is limited to studies that have based their comparisons on stuctures with comparable thermal performance. When you consider these references and the entire body of work on this subject, it is clear that except in some hot, arid climates where large diurnal temperature swings may favor high mass building systems. such as concrete, wood-based building systems can provide comparable thermal performance while significantly reducing the carbon footprint of the structure. (Reid Miner, NCASI)	**Noted. Danny will draft a few lines**, but will also cross reference industry and forestry chapters, not a whole section.	**Danny**
6-9	A	0	0	0	0	A new section is needed between sections 6.4 and 6.5 that discusses the opportunities to reduce the carbon footprint of structures through selection of building materials and systems that are less carbon-intensive to produce. Key references include; (1) Borjesson, P., and Gustavsson, L. 2000. Greenhouse gas balanced in building construction: Wood versus concrete from life-cycle and forest land-use perspectives. Energy Policy 28(2000):575 588, (2) Lippke, B., Wilson, J., Perez-Garcia, J., Bowyer, J., and Meil, J. 2004. CORRIM: Life-cycle environmental performance of renewable building materials. Forest Products Journal 54(6):8 19, (3) Scharai-Rad, M., and Welling, J. 2002. Environmental and energy balances of wood products and substitutes. Food and Agriculture	See above	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						Organization of the United Nations (FAO). http://www.fao.org (June 4, 2005). More references on this list are shown in the cell below (Reid Miner, NCASI)		
6-10	A	0	0			"In contrast to refrigeration systems using halocarbons as a working fluid, foam insulation that uses halocarbon blowing agents can have greenhouse gas emissions that exceed the climate benefits of avoided CO2 due to the heating energy saved by the insulation." is not only not referenced, it is factually incorrect. (Nick Campbell, ARKEMA SA)	**Noted. Danny will double check** inputs used for his calculations that formed the basis of the claim that is disputed here, and will try to write up a paper accepted in time to be citable.	Danny
6-11	A	0	0			How is the rebound effect addressed in the chapter as it is not mentioned? Diana said it is addressed in the chapter briefly, the LAs state that in the residential sector according to the literature it is not that important. Rebound effect for new technologies being developed and their impact on fuels. Perhaps a need to pay more attention to new technologies. (Capetown Industry Expert Meeting, Industry)	**Noted. Rebound effect is discussed in sections 6.7.8, and 6.8.33.**	**Danny will** issue and ac issue). We a 11.**Danny,**
6-12	A	0	0			Chapter needs to reflect the regional differences and that the key conclusions in the US or European are based on houses that are big with few Asian studies. Most energy increase will take place in Asia but houses are small there so perhaps its important to highlight the differences in house sizes. (Capetown Industry Expert Meeting, Industry)	Partially accepted. more differentiation will be made between OECD and developing countries in the SOD. We cannot make house sizes explicit.	
6-13	A	0	0			• Different assumptions for potentials summary should be noted even in short summary. • Check units for technology table – now impossibly high. (Capetown Industry Expert Meeting, Industry)	Accepted.:	1. Diana v assumption 2. IF this ta Hiroshi will
6-14	A	0	0	0	0	A well organised chapter. (Rutu Dave, IPCC WGIII TSU)	Thanks	
6-15	A	0	0			Overall the chapter covers topic well. It does not deal with temperate and tropical climates as comprehensively as it does with continental type climates. Although the need for 'baseline' data is mentioned briefly (e.g. page 19, line 26) , this is a critical problem for most energy-based GHG reducing activities. The rule of business 'if you cannot measure it you cannot manage it' applies for people, money, production as well as energy. Internationally, most work on the demand side GHG reduction (energy efficiency and energy conservation) has been based on theoretical models and very limited sample investigations. Good baseline data is expensive to collect, but is essential in order to correctly identify GHG minimisation opportunities while minimising wasted investment. (Nigel Isaacs, BRANZ Ltd)	Comments partially accepted. Space limitation does not permit as to say much more. Climate regions will be added in technology assessment table. Baseline data are inadequate, and this needs to be dealt with in future research.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-16	A	0	0			I cannot find the chapter"6.6.2.1.7 Commissioning and retro commissioning policies" included in the ZOD. I think this chapter is important. (Shuichi Miura, Tohoku university of art & design)	Noted. –**There is already discussion on this: section 6.4.5.5. addresses the issue. more references will be added where this topic IS discussed.**	GEoff
6-17	A	0	0			More key references regarding the opportunities to improve a structure's carbon footprint by using low-carbon materials and systems. (4) Peirquet, P., Bowyer, J., and Huelman, P. 1998. Thermal performance and embodied energy of cold climate wall systems. Forest Products Journal 48(6):53–60, (5) Lenzen, M., and Treloar, G. 2002. Rejoinder to: Greenhouse gas balanced in building construction: Wood versus concrete from life-cycle and forest land-use perspectives. Energy Policy 30(2002):249-255, (6) Sarri, A. 2001. Environmental specifications of building parts and buildings (in Finnish). TKK Rakentamistalous [Helsinki University of Technology, Construction Economics and Management]. Published by Rakennustietosaatio RTS [Building Information Foundation RTS], Helsinki. Sponsored by Rakennustieto Oy [Building Information Ltd.]. http://www.rts.fi/Ymparistoselosteet.pdf. More on this subject is contained in the cell below. (Reid Miner, NCASI)	See reply to 6-8	
6-18	A	0	0			General comment :This chapter is well balanced and focused on solutions, with technology improvements followed by policy possibilities. (Antoine BONDUELLE, E&E_Consultant)	Thanks	
6-19	A	0	0			Clear and with a lot of useful information (Marco Mazzotti, Institute of Process Engineering)	Agreed!	
6-20	A	0	0			This is a strong chapter in terms of detail but I think its overall analysis and impact could be improved by more attention to some of the economic fundamentals of the sector. The three overwhelming characteristics of the buildings sector are surely (i) the immensely long lifetime of the capital stock, so that failure to act now narrows future options and risks high costs of retrofit; (ii) the prevalence of split-incentive market failures because of the dominace of tenant-landlord arrangements in some domestic and most commercial sectors, and (iii) the immateriality of energy costs for most occupiers (at least commercial) amplifying deep-rooted market failures. The result is a sector where the need for action affecting diverse participants is urgent, but where classic economic instruments have limited impact, and where regulatory instruments are generally more effective and yield net economic benefits. (Michael Grubb, Cambridge University)	(i) accepted and will be addressed. We must definitely emphasize for policy makers the issue of "lost windows of opportunity" with delay. Items (ii) and (iii) are discussed in policy section – make sure that these important points are not buried. For items with very long investment cycles, should base decisions on rate of return rather than payback period. Geoff says to decribe the process of making decisions at the beginning of the policy	Geoff

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
							section – often does not even consider lifecycle costs. **Geoff will draft something.**	
6-21	A	1	17	1	26	I propose the chapter 6.4 entitled Energy efficiency in buildings and equipment as follows. 6.4.2 Thermal Envelope 6.4.2.1 Walls etc. 6.4.2.2 Windows 6.4.2.3 Air leakage 6.4.3 Heating Systems 6.4.3.1 Passive solar heating 6.4.3.2 Space Heating (Boiler and Heat Pump) 6.4.4 Cooling Systems 6.4.4.1 Reducing the cooling load 6.4.4.2 Passive and low-energy cooling techniques 6.4.4.3 Vapor-compression chillers 6.4.4.4 Absorption chillers 6.4.4.5 Desiccant dehumidification and cooling 6.4.9 HVAC Systems 6.4.9.1 Ventilation, fan, pump, air-to-air heat exchanger 6.4.9.2 Control and Information system 6.4.9.3 Commissioning 6.4.9.4 Operation, maintenance and performance benchmarking 6.4.10 Lighting 6.4.10.1 High efficiency lighting system (fluorescent lamp, LED lamp) 6.4.10.2 Daylighting 6.4.11 Appliances, consumer electronics and office equipment 6.4.11.1 Cloth washing machine 6.4.11.2 Dish washing machine 6.4.11.3 Refrigerator 6.4.11.4 IH (Induction Heating) cooker 6.4.11.5 Gas cooking stove 6.4.11.5 LCD TV set" It may be possible to combine 6.4.6 Cogeneration, 6.4.7 District heating and cooling system and 6.4.8 Solar system to “Alternative Heat Source” (Yoshiyuki Shimoda, Osaka University)	Accepted. Will be reorganized according to a later draft by commenter.	Danny. Ge 6.4.7.2.
6-22	A	1	17	1	26	6.4.5 Domestic hot water		Distributed

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						6.4.5.1 Water saving fixture 6.4.5.2 Solar thermal 6.4.5.3CO2 heat pump water heater and waste heat recovery 6.4.5.4 High efficiency condensing boiler 6.4.6 Cogeneration 6.4.6.1 Heating/Cooling/Hot water 6.4.6.2 Generator (Engine, Gas turbine, Fuel Cell) 6.4.7 District heating and cooling system 6.4.8 Solar system 6.4.8.1 PV 6.4.8.2 Solar heat (Yoshiyuki Shimoda, Osaka University)		will fix dist
6-23	A	2	0	26		weight of this chapter should be higher: max 42% of CO2-emissions, year 2030 (Mikko Saari, VTT Technical Research Centre of Finland)	ACCEPTED by US – IPCC needs to accept this, too! Chapter 6 needs more pages.	
6-24	A	2	0	26		we need to reduce the energy need as low as tecnically and economically possible to increase amount of renewables, this should be stated clearly (Mikko Saari, VTT Technical Research Centre of Finland)	Noted. .	
6-25	A	2	0	26		there is too much too simpilified comparision of systems and solutions, in many cases the "better" systems are not suitable for all purposes, e.g. cold climates, systems will not operate well in real world or they are not cost effective systems (Mikko Saari, VTT Technical Research Centre of Finland)	Noted. We don't think that we imply this. Enhanced references to climate distinctions should ensure that there is no misunderstanding.	
6-26	A	2	0	26		reader can´t follow are recommeded solutions expensive prototype technology or allready available in market. I think that there should be separate part for "natural" "eco" systems and "high tech" basic systems and "high tech" future systems (Mikko Saari, VTT Technical Research Centre of Finland)	Accepted. technology assessment table will make these distinctions. Misleading wording in text has been revised.	
6-27	A	2	35	6	24	The executive summary is partly a duplication of the introduction (section 6.1) (Harm Jeeninga, ECN)	**Mark to address**	
6-28	A	2	35	4	34	Security of supply is hardly mentioned. Specifically the lock in effects in developed countries might lead to severe problems in the long run due to the long life time of the energy infrastructure (very dense grid with only limited energy flows making it difficult to replace with an alternative infrastructure) (Harm Jeeninga, ECN)	Noted. This needs to be addressed in chapter 4, but we do make a reference to its importance in the CO-benefits section.	
6-29	A	2	35	4	34	Please put the developments in the appropriate context by making a distinction between relative developments (% change) and absolute changes (in Mton). Although in relative terms, signicant savings are feasible, in absolute terms CO2	Accepted - Additional assessment will address this issue. In addition, wording will be made more clear where text	Mark

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						emissions will still go up (Harm Jeeninga, ECN)	maybe misleading.	
6-30	A	2	35	4	34	Appliances is hardly mentioned in the executive summary (Harm Jeeninga, ECN)	**Accepted.**	**Mark**
6-31	A	2	36			SPMs the give the percentage of the sector in 2000 for transport (chapter 5, page2, line 24), in 2004 for buildings (chapter 6, page2, line 36) and in 2002 for industry (chapter 7, page 2, line 35). It would be nice to have the same date everywhere. (Michel Petit, CGTI)	**Accepted. 2000 will be used, but depends on other chapters, Too.**	**Mark**
6-32	A	2	41	2	44	The list of ways to reduce emissions associated with residential/commerical buildings should include a fourth way: i.e. the use of building materials and systems that are less carbon-intensive to produce. (Reid Miner, NCASI)	Embodied-energy issue again – see reply above	
6-33	A	3	21			For scenario B2, average INCREASE IN annual energy use….. (Harm Jeeninga, ECN)	**Accepted. DOne**	
6-34	A	3	33			Report would be improved if it mentioned improvement in financing buildings to include energy operating costs along with Principle, Interest, Taxes and Insurance (PITI) in calculating the size of a mortgage and the interest rate to be charged on mortgages. Favorable financing of energy efficient mortgages would contribute to the acceptance of friendly technology. Such financing is an honest evaluation of the ability of the mortgagee to pay his obligation. (Steven Freedman, Energy Consultant)	Accepted. make sure that this is addressed in the barriers section (this is a solution to the upfront-cost barrier)	**Diana**
6-35	A	3	33			In mentioning designing buildings as systems mention should be made of designing and constructing new buildings (as differentiated from modifying existing buildings) to have cogeneration (or called CHP) included as original equipment. Such initial construction will greatly reduce the net additional cost of the cogeneration system. (Steven Freedman, Energy Consultant)	Rejected. Statement too general. Cogen is one of many approaches that can save energy,but in the sentence under sentences, the emphasis is on two generic things that are not normally done - integrated design (which could include cogen) and consideration of passive systems.	
6-36	A	3	33	3	35	integreted design prosess is so important that is should have higher weight (Mikko Saari, VTT Technical Research Centre of Finland)	Agreed. We completely agree. IDP is flagged later.	As well, **Da** IDP for cha
6-37	A	3	37	3	40	computer control ("intelligence") without practically/mechanically well operating systems is dangerous, sounds like recommendation (Mikko Saari, VTT Technical Research Centre of Finland)	Rejected. We don't imply this, here or in the chapter.	
6-38	A	3	44			A sentence should be added saying "There are opportunities for reducing the carbon footprint of buildings through selection of materials and systems that are less	See above.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						carbon-intensive to produce." (Reid Miner, NCASI)		
6-39	A	3	50	3	51	Change "ancillary benefits" to "co-benefits." The TAR (WG III, Pg. 708) defines ancillary benefits as "The ancillary, or side effects, of policies aimed exclusively at climate change mitigation." Co-benefits are defined (WG III, Pg. 711) as " ...the benefits of policies that are implemented for various reasons at the same time -- including climate change mitigation ..." In the real world, policies are almost always implemented to achieve multiple benefits, so co-benefits is the more correct term. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	Accepted. In standard economic terminology, co-benefits – applies at micro level, ancillary benefits at macro level. 6.6 is entitled "Co-benefits …." So, should do what reviewer suggests.	Sev.
6-40	A	4	5	4	13	Policies implementing the Montreal Protocol have resulted in considerable GHG reductions from buildings (reference IPCC Special Report on HFCs, 2005). (Nick Campbell (Batch 2), ARKEMA SA)	Noted. See comment above on F-gases. No need to reference Montreal Protocol.	
6-41	A	4	36	6	24	Please also include the impact of fuel switches (e.g. to flexible energy carriers with a non-fixed carbon content) (Harm Jeeninga, ECN)	Noted. Already addressed (line 47-48)	
6-42	A	4	45	4	47	Indirect GHG emissions from production of building materials could be reduced by the selection of low emission material in the process of design. Consideration of production process in the material selection should be add in the cutting way of GHG emissions. (Shuichi Miura, Tohoku university of art & design)	Accepted. **Danny will add** some lines on this. Clarify here – to explicitly distinguish embodied and operating energy.	Danny
6-43	A	4	45	4	47	The list of ways to reduce emissions associated with residential/commerical buildings should include a fourth way: i.e. the use of building materials and systems that are less carbon-intensive to produce. (Reid Miner, NCASI)	Noted. IN principle, correct. In practice, building material substitution will contribute vastly less than the other methods, thus this is not considered as a separate category.	
6-44	A	4	47	42		was in the end of the 1980's (see state of the art at : http://www.bwea.com/marine/index.html and http://www.poemsinc.org/links.html or http://www.worldenergy.org/wec-geis/publications/reports/ser/wave/wave.asp) (MICHEL PAILLARD, IFREMER)	We do not understand the comment.	
6-45	A	4	48	4	49	The 'major fuel used in buildings' is not necessarily electricity in all locations. Should this read 'major GHG producing fuel used in buildings' ? (Nigel Isaacs, BRANZ Ltd)	Accepted. Revise to read; "to the extent that electricity is an important energy use in buildings, ..."	
6-46	A	5	9	5	12	It would be important to be able to maintain living environment of today when reducing energy use. If energy use were reduced by 90%, it seems to me that it might be possible to keep the environment such as air quality for example.	Noted. The paragraph is not about env co-benefits (if that is what the comment refers to). However, the sentecne can be	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						(Yoon-Young Kang, Korea Energy Economics Institute)	improved. Revise to read: "...can substantially reduce energy use while providing the same services".	
6-47	A	5	11	5	11	'reducing infiltration' - unless artifical means are provided, some infiltration is required. In all climates the issue is 'control' of infiltration, not simply reduction (Nigel Isaacs, BRANZ Ltd)	Accepted. The word "uncontrolled" has been inserted in front of "infiltration"	
6-48	A	5	12	5	12	passive solar is not feasible in Finnish climate (PEP -EU-project, Passive House Institute, Germany) (Mikko Saari, VTT Technical Research Centre of Finland)	Rejected. We dispute that it is not feasible in Finland, and we do not even imply this.	Check CEP needed. Ch in Finland. approaches Danny whe
6-49	A	5	20	5	27	This is an excellent summary of a key set of barriers to the reduction of CO2 emission from buildings which should be reflected in the chapter's executive summary and the report's higher level summaries. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	**Accepted. Will be included.**	**Diana**
6-50	A	5	38			a "key conclusion" is presented in the introduction (Harm Jeeninga, ECN)	Noted. No change.	
6-51	A	5	38	6	18	This text is same as the Executive Summary. Executive Summary can be summarized. (Takashi Inoue, Tokyo University of Science)	**Accepted.**	**Mark**
6-52	A	5	51	5	53	Comment: speaking both, but separately, in terms of energy demand (PJ/year) and in terms of specific energy demand, e.g. energy per square meter MJ/m2.year, would make it much clear to discuss the drivers for increase in energy / specific energy demand. (Bernard Aebischer, CEPE/ETHZ)	Accepted, we will clarify this discussion.	
6-53	A	5	53	5	53	Add in a new line: "Major drivers for increase in specific energy demand in commercial buildings (in developped countries almost exclusively in electricity demand!) are 1. increase of opening hours and higher (lower) interior temperature in cold (hot) climates, 2. more/better and additional new energy services and 3. more electricity uses in order to reduce heating demand, e.g. mechanical ventillation and heat recovery (Jakob et al., 2006 a). Important drivers for additional (to the one mentionned as drivers for increase in specific demand) increase in energy demand are for the residential sector: 1. increase in population, 2. increase in floor area per cap., 3. increase in heated floor are per cap (mainly in countries in transition and possibly some developping countries with central heating systems replacing single stove heating) and cooled floor area per cap. In the	Noted. Unfortunately we do not have space for this level of detail.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						commercial sectors the main drivers are increase in employees and in services of the commercial sector (partly industrial -> commercial sector) and points 2 and 3 in analogy to the residentail sector. (Bernard Aebischer, CEPE/ETHZ)		
6-54	A	6	25	7	34	paragraph 6.2 and 6.3 include some repetition (Harm Jeeninga, ECN)	Rejected. 6.2 – past; 6.3 – future projections. Therefore, there is no repetition.	
6-55	A	6	36	6	36	"trally" → "centrally" (Yoon-Young Kang, Korea Energy Economics Institute)	Accepted. Fixed.	
6-56	A	7	7	7	8	Economic growth is not necessary to grow building energy use. More households using more buildings will grow energy use, as will changes in lifestyle, appliances, etc - in the developed countries this is a reflecting of changing social patterns.. (Nigel Isaacs, BRANZ Ltd)	**Noted. Comment is true, but the point of the paragraph is about the key drivers in developing countries.**	
6-57	A	7	10	7	11	Comment: In Switzerland: Growth 1960-2000 in population = +34% in employees in the commercial sector = +169%! May be similar in other industrialised countries. (Bernard Aebischer, CEPE/ETHZ)	Agreed. This is consistent with the chapter.	
6-58	A	7	15	7	15	replace "Middle East / North America" by "Middle East / North Africa" (Bernard Aebischer, CEPE/ETHZ)	Accepted. Fixed.	
6-59	A	7	49			Section 6.4.1 - The explanation covers the critical area of integration of all aspects of the design, and the need to ensure good communication. However, energy efficient design can be achieved without energy performance simulation software, although of course the software can be a major help - the word 'critical' over promotes the software while dismissing the benefits of knowledge of the local climate, local construction and local culturasl expectations . (Nigel Isaacs, BRANZ Ltd)	Accepted. Text modified.	
6-60	A	8	6	8	6	replace "reducing the glazing area" by "optimising the glazing area". Depending on the quality of the glazing, internal loads etc. minimizing the glazing area does not provide minimal energy demand, even in cold and overcast climates! (Bernard Aebischer, CEPE/ETHZ)	Accepted, cvhanged.	
6-61	A	8	10	8	11	Consider adding technology to shift thermal loads (heating and airconditioning) from times and solarwhen delivered energy is either obtained in a low efficiency or expensive or unavailable manner (electricity during peak air conditioning times and solar heat at night). (Steven Freedman, Energy Consultant)	Rejected. True, but the focus of the sentence is on the building envelope.	
6-62	A	8	14	8	16	There are severe limitations from this use of heat pumps (FÉLIX HERNÁNDEZ, IEG-CSIC)	Rejected. We do not imply otherwise.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-63	A	8	27	8	27	replace "… and GHG emissions" by "… and GHG emissions in countries where electricity is produced mainly from fossile fuels" (Bernard Aebischer, CEPE/ETHZ)	Accepted. Text changed.	
6-64	A	8	38	8	43	Even this paragraph says the occupants behavior is important factor of energy saving, there is no discussions on this point in this chapter. In Japan, a kind of HEMS (Home Energy Management System) which displays energy bills and energy saving measures to the occupants for motivating energy-saving activities shows the energy reduction effect in residential buildings. Reference: Ueno, Sano, Saeki and Tsuji 2006: Effectiveness of an energy-consumption information system on energy savings in residential houses based on monitored data, Applied Energy, 83 pp.166-183 (Yoshiyuki Shimoda, Osaka University)	**Accepted. Further discussion will be added.**	**Geoff to pr this section others on fi Geoff. Mit**
6-65	A	8	39	8	43	if energy consumption is high, behavior is important factor, but when energy consumption is very low, e.g. in passive houses, absolute importance is also low (Mikko Saari, VTT Technical Research Centre of Finland)	Noted. True, but behaviour (thermostat setting) is actually more important in relative terms. If space permits, say something in revised and expanded section 6.4.1.5.	
6-66	A	8	46	8	53	Not only by the improvement of individual equipment but also introducing building energy management system which optimizes the energy control perceiving human behavior and equipment operation, information gathering and analysis for decision of energy saving could be made possible. Reference: http://www.eccj.or.jp/eng/e3208bems.html (Shuichi Miura, Tohoku university of art & design)	Agreed - words included.	
6-67	A	8	52	8	52	replace "result in buildings" with "replace in new buildings" and "conventional buildings" with "conventional new buildings" (Bernard Aebischer, CEPE/ETHZ)	Accepted. Inserted word “new” before “buildings”.	
6-68	A	8	54	8	54	Include sub-chapter: 6.4.1.7: Title: "Replace existing buildngs by new buildings" Text: From a holistic point of view that includes economics, life cycle environmental impact, user utility etc., building demolition and reconstruction of new buildings might be favourable over energy efficient building renovation (Ott et al 2002) (Bernard Aebischer, CEPE/ETHZ)	**Accepted. Done.**	**Danny:** in r mention tha can pay bac replace an e performanc environmen
6-69	A	9	10	9	15	cold bridges should be added to the list (Mikko Saari, VTT Technical Research Centre of Finland)	Accepted. Done.	
6-70	A	9	19	9	19	Add reference: Jakob, 2006 (Bernard Aebischer, CEPE/ETHZ)	Accepted. Done.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-71	A	9	20	9	24	Since the level of local/national building code have wide variety with countries, comparison with the building code is meaningless. (Yoshiyuki Shimoda, Osaka University)	Accepted. Addressed by inserting "the most stringent" before "standards"	
6-72	A	9	24	9	25	solar gains as well (Mikko Saari, VTT Technical Research Centre of Finland)	Accepted. Done.	
6-73	A	9	24	9	25	Comment: not true if you consider the whole year! Omit the sentence "Reducing the envelope …" (Bernard Aebischer, CEPE/ETHZ)	**Accepted – will be done.**	**Danny to d on therma already ad issue of int to specific ref to recer**
6-74	A	9	27	9	34	In Section 6.4.2, the coverage of the thermal envelope is rather anecdotal. In particular the paragraph on Page 9 Lines 27-34 focuses unduly on novel, but often unproven, technologies – indicating that the text has been written more by the research community than current practitioners. The comment '….at lower cost than some conventional insulation materials…' seems to be unsubstantiated and unreferenced. It appears that the Manz (2004) reference only refers to the second half of the paragraph. (Paul Ashford, Calebgroup)	Accepted - Paragraph deleted, so it is no longer applicable.	Danny resto
6-75	A	9	35	10	9	There are another options of energy efficient window system. The airflow windows, which has double glazing and mechanical ventilation between these glazing, combined with built-in automatic slat-angle control blinds for daylight illumination and solar shading with an artificial lighting control system shows the great energy saving effect in Japanese office building. (Yoshiyuki Shimoda, Osaka University)	Rejected. WE do not have space for including everything.	Mark may r
6-76	A	9	40	9	40	Replace "standard double-glazed" by "non-coated double glazed". In many countries, standard double-glazed windows are coated and therefore are already down to the mentionned level of 25%. Mention eventually the U-Value refering to 100%. (Bernard Aebischer, CEPE/ETHZ)	Accepted. Changed.	
6-77	A	9	41	9	41	replace "50%" by "up to 75%" (Bernard Aebischer, CEPE/ETHZ)	Accepted, changed.	
6-78	A	9	43	9	43	Add sentence: "In spite of these technical improvements costs of glazing and windows remained constant or even dropped in real terms (Jakob and Madlener 2004)" (Bernard Aebischer, CEPE/ETHZ)	Accedpted.	Danny will

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-79	A	10	21	10	23	Is an advertisment for the commercial product 'Aeroseal' appropriate? (Nigel Isaacs, BRANZ Ltd)	Accepted, deleted.	
6-80	A	10	30	10	42	The air flow window that is effective for solar shading should be moved to the section 6.4.2.1. window. (Takashi Inoue, Tokyo University of Science)	Accepted.	Danny will
6-81	A	10	36	10	42	passive solar is not feasible in Finnish climate (PEP -EU-project, Passive House Institute, Germany), 15 kWh/m2 is not possible to achieve in Finnish climate (due to very cold periods in winter compared to e.g. Germany) by cost effective technology (Mikko Saari, VTT Technical Research Centre of Finland)	**Noted. Literature will be consulted to see if statement needs to be modified.**	**Danny t** Deleted: Danny to check.
6-82	A	10	46	11	41	Not all industrialised countries are cold enough for district central heating or hot enough for district cental cooling. This technology need not receive such a large coverage (Nigel Isaacs, BRANZ Ltd)	Rejected. We don't imply this. Note the "or".	Formatted ... [1]
6-83	A	11	5	11	22	Combined heat and power system at the scale of a house in now experimented, with promising results and large potentials for generating of low-carbon electricity. A study on France shows that up to 25-50 % of national electricity may be produced by 2040. Reference : Bonduelle A., Plouchart G., Barbier C., Radanne P. 2004, "Cogénération et émissions de CO2, impact de la pénétration de la cogénération décentralisée de faible puissance sur les émissions de CO2 en France", CLIP N 15, janvier 2004, IDDRI Paris. Available on http://www.iddri.org/iddri/html/publi/cahiers-du-clip.htm (Antoine BONDUELLE, E&E_Consultant)	Rejected. The issue of small-scale cogen is complicated (high heat:elec ratio, represents an improvement only if heat can be used, in buildings with high-performance envelopes, space-heating loads are minimal, DHW load can be largely met by solar during summer). No space to address these issues.	Formatted: English (U.S.)
6-84	A	11	29	11	41	You may want to expand a little bit your analysis of heat pumps on the basis of the information provided by Masumoto, Teruaki, 2005, Electrical technologies to address the requirement for ultimate resource productivity, Proceedings of the IPCC Expert Meeting on Industrial Technology Development, Transfer and Diffusion, September 21-23, 2004, Tokyo (Cédric Philibert, International Energy Agency)	Noted. Will be considered, if space permits.	Danny Deleted: No space to mention.
6-85	A	11	29	11	41	For building in which both cooling load and heating load are occurs, heat recovery (double-bundle condenser) heat pump which produce heating heat and cooling heat simultaneously have great energy saving potential. (Yoshiyuki Shimoda, Osaka University)	Accepted. Quite true, possibly work in this statement.	Danny Formatted ... [2]
6-86	A	11	29	11	29	As well as electricity driven heat pump, gas engine heat pump has also been used in Japan. The COP of the latest model is 1.5 (primary energy base) and this high COP	Accepted. Good point, possibly work in this statement.	Danny Formatted ... [3]

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						was established by utilizing the waste heat from the gas engine for heating. Reference: http://www.aisin.co.jp/life/ghp/english/ (Yoshiyuki Shimoda, Osaka University)		
6-87	A	11	36	11	37	The COP of a conventional system is 2-2.5 is lower than the latest model. (Shinichi Nakakuki, Tokyo Electric Power Company)	Accepted. Rephrase: For a heat pump with a COP of ...., the COP is increased to ....”	Danny
6-88	A	11	37	11	41	add : this type of application of geothermal energy is fastly growing in Europe (notably Sweeden and Switzerland, more recently in France) and is one of the most efficient substitute for fossil fuels in heating systems for housing and tertiary buidings. (VARET JACQUES, BRGM)	Noted. Will be considered if space permits and literature is identified.	Danny
6-89	A	11	37	11	37	For the purpose of GHG gas reduction, Seasonal COP evaluation is preferred rather than COP evaluation. In addition, valuable speed compressor greatly reduce energy use in off-peak season and increase seasonal COP. (Yoshiyuki Shimoda, Osaka University)	Noted. True, but purpose is only to illustrate relative improvement. See reply to 6-88	
6-90	A	11	37	11	37	COP is affected by kind of heat source, part-load ratio, heat sink/source temperature and supply temperature. Then, COP value without these conditions (such as ISO T1 condition) may cause a misunderstanding. (Yoshiyuki Shimoda, Osaka University)	True. See reply to 6-88	
6-91	A	11	39	11	40	replace "in two US studies (" by "in a Swiss and two US studies (Erb et al. 2004, " (Bernard Aebischer, CEPE/ETHZ)	Accepted.	Danny to
6-92	A	11	45			please remove the word "in" (Harm Jeeninga, ECN)	Accepted, addressed.	Done??
6-93	A	12	5	12	7	Estimates of non-commercial fuel (e.g. 'free wood') are subject to large margins of error as they are regularly based on inadequate data, small surveys or at worst are the 'remainder' between an estimate of total fuel and the reported commercial fuel sales. Our research on energy in NZ houses found the 'offical' Government statistic of about 5% of residential energy coming from solid fuel (coal and biomass) is incorrect - monitored data from a random sample of 400 houses suggests it is closer to 15%. Source: page 51, Year 9 Household Energy End-use project (HEEP) report from web page www.branz.co.nz/main.php?page=HEEP. (Nigel Isaacs, BRANZ Ltd)	**Noted. If space permits, issue will be mentioned.**	Diana
6-94	A	12	13			The phrase "stoves using renewably harvested fuels" should be removed because the emission factor is not a function of how the fuel is harvested. (Reid Miner, NCASI)	**Accepted.**	Danny

Formatted ... [4]
Formatted ... [5]
Formatted: English (U.S.)
Deleted: Anything we would say would be vague and without a supporting reference. No change made.
Formatted: English (U.S.)
Formatted ... [6]
Formatted: English (U.S.)
Formatted ... [7]
Deleted: Danny to check ref and add
Formatted ... [8]
Deleted: Done.
Formatted ... [9]
Formatted ... [10]
Formatted ... [11]
Deleted: Diana – this is your section.
Formatted ... [12]
Deleted: Do it.
Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
6-95	A	12	17			The phrase "even with sustainably harvested fuel," should be removed. It is unnecessary, potentially confuses the reader and introduces a term that is not defined- i.e. "sustainable harvested". The important point is clearer without the phrase. (Reid Miner, NCASI)	**Accepted.**	Danny
6-96	A	12	31	15	21	The substantial increase of CO2 emission is predicted in the developing countries as the increase of population and the economical growth. These countries are mainly exists in low latitudes. The more consideration of the CO2 mitigation measures in these hot and humid developing countries is absolutely essential. For example, shading, natural draft, solar water heater and change of lifestyle. (Takashi Inoue, Tokyo University of Science)	Noted. It will be considered when the chapter is restructured. And the balance of coverage is decided.	Diana and M important d
6-97	A	12	45	12	45	replace "facing east or west" by "facing east, south or west" reason: in moderate climates such as Switzerland, Germany etc. south orientiation is more critical (Bernard Aebischer, CEPE/ETHZ)	**Accepted.**	~~Danny~~
6-98	A	12	49	12	49	replace "increasing insulation" with "increasing insulation (only for buildings with low internal or external heat loads)" (Bernard Aebischer, CEPE/ETHZ)	Rejected. No change.	
6-99	A	13	5	13	5	add bullet point "avoid corner rooms with two or more glazing facades" (Bernard Aebischer, CEPE/ETHZ)	Rejected. No change.	
6-100	A	13	6	13	6	replace "using windows with a low solar heat gain" with " using selctive glazing with a low solar heat gain and a high daylight transmission factor" (Bernard Aebischer, CEPE/ETHZ)	**Accepted.**	Danny
6-101	A	13	14	13	15	Description on peak load is not important for GHG gas reduction. (Yoshiyuki Shimoda, Osaka University)	Rejected. We mention it because reducing peakloads is a significant co-benefit.	
6-102	A	13	25	14	15	I think that reducing 4-5 degrees from over 30 degrees would not affect much decision to turn on, for example, cooler. 25 is still hot. (Yoon-Young Kang, Korea Energy Economics Institute)	Rejected. No change. The statement in the text is supported by the cited reference.	
6-103	A	13	26	13	46	indoor air quality may be poor in naturally ventilated buildings -> mechanical ventilation with effective heat recovery (Mikko Saari, VTT Technical Research Centre of Finland)	Accepted. True. Natural ventilation is not used in polluted regions.	Danny
6-104	A	13	50	14	15	Since the air temperature, especially nighttime air temperature is expected to increase by global warming and urban heat island phenomena in the future, the effect of night-time ventilation becomes to be decreased. The additional description is needed. Reference: Shimoda, Y. 2003:Adaptation measures for climate change and the	**Accepted.**	**Danny t**

Deleted: Do it.
Formatted ... [13]
Deleted: No room for more (someone else criticizes for saying too much on cooling).
Formatted ... [14]
Deleted: Change "any climate" to "most climates".
Formatted ... [15]
Formatted ... [16]
Formatted: English (U.S.)
Formatted ... [17]
Formatted ... [18]
Deleted: Do it.
Formatted ... [19]
Deleted: Danny to check this ref.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						urban heat island in Japan's built environment, Building Research and Information, Vol. 31, No. 3-4, pp.222-230 (Yoshiyuki Shimoda, Osaka University)		
6-105	A	14	45	14	51	Modify text to reflect the state of the art of commercially available equipment. 6.4.4.3 Air conditioners and vapor-compression chillers Air conditioners used for houses, apartments, and small commercial buildings have a COP ranging from 2.2 to 3.8. Chillers are larger cooling devices that produce chilled water (rather than cooled air) and are used in larger commercial buildings. The efficiency of centrifugal chillers is discussed at some length in section 5.2.2.1 of the IPCC/TEAP report on HFCs and PFCs (IPCC/TEAP, 2005). Since that report was prepared, there have been further technology advances in centrifugal chillers. The COP of centrifugal chillers employing HCFC-123 has been raised from 7.45 (0.472 kw/ton) to 7.87 (0.447 kw/ton). The screw and scroll chillers … [continue as in the original FOD]. (James Crawford, Trane/American Standard)	**Noted – will be checked.**	**Danny t**
6-106	A	14	46	14	47	Mini split type room air conditioner (2.8kW) on sale in Japan have a cooling COP (ISO T1 condition) ranging from 4.5 to 6.2 due to the "Top Runner Standard". Reference: http://www.eccj.or.jp/catalog/2004w-h/air-con/28.html (in Japanese) (Yoshiyuki Shimoda, Osaka University)	**Accepted. Add this.**	Danny/H
6-107	A	14	46	14	50	COP is affected by kind of heat source, part-load ratio, heat sink/source temperature and supply temperature. Then, COP value without these conditions (such as ISO T1 condition) may cause a misunderstanding. (Yoshiyuki Shimoda, Osaka University)	**Accepted. Add** ", depending on operating conditions: after "3.5".	
6-108	A	14	47	14	48	After the word "from 2.2 to 3.5.", the following sentence should be added; "But, recently high efficient products having a COP ranging from 3.2 to 6.5 are available in the cooling capacity range up to 4.0 kW in Japan." Refer to Energy Conservation Center, Japan by visiting its web site (www.eccj.or.jp/catalog/) (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	**Do it.**	
6-109	A	14	48		51	Replace the text in the FOD with that proposed in the attached spread sheet. This draws on the recent IPCC/TEAP report by reference, leading the reader to more thorough coverage of centrifugal chiller efficiency without adding length to the coverage of AR4 itself, and reflects recent technology advancements. (James Crawford, Trane/American Standard)	**Accepted.**	**Danny. missing,**

Deleted: Danny to check this.

Formatted ... [20]

Formatted ... [21]

Formatted ... [22]

Formatted ... [23]

Deleted: Ask TSU for spread sheet – seems to be missing,

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-110	A	14	48			Change 3.5 to 3.8 reflects reflect the current state of the art in unitary air conditioners. (James Crawford, Trane/American Standard)	**Accepted. Do it.**	Danny
6-111	A	14	49	14	50	For centrifugal chillers, variable speed compressor on sale in recent year improves the part-load efficiency and seasonal efficiency very much. Reference: Seki W., K. Ueda, Y. Shirakata, K. Nishii, Y. Hasegawa, T. Komuro and Y. Iritahi, 2005: Development of a high-performance turbo chiller, 8th IEA Heat Pump Conference 2005 (Yoshiyuki Shimoda, Osaka University)	**Noted – will be checked.**	**Danny t… get copy**
6-112	A	14	51	15	2	High energy efficient split air conditioners existing in Japan are more efficient than chiller systems, especially in hot humid climate, such as Japan, South East Asia, and Southern China. Therefore, the comparison between chiller systems and small window or split systems is not universal around the world, and then delete the sentences starting from "but" on line 54 to line 2, page 15. (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	**Do it.**	
6-113	A	15	3	15	9	Individually installed high efficient small split air conditioners can minimize the total energy by adopting individual operating load,compared to central chiller systems. Therefore the sentence should be changed appropriately. (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	**Do it.**	
6-114	A	15	7	15	9	In Japanese experience, centralized chiller for residential air conditioning is not energy efficient rather than small split-unit air conditioner since heat loss is large and the COP of mini split air conditioner is high. Is there any basis for this sentence? (Yoshiyuki Shimoda, Osaka University)	Modify statement	
6-115	A	15	13	15	20	There are other types of generator such as gas engine and there are many kinds of fuel cells such as PEFC, SOFC and PAFC. The efficiency, capacity, GHG mitigation potential and application of cogeneration differ by the kind of generator. More description is necessary. (Yoshiyuki Shimoda, Osaka University)	Noted, this level of detail cannot be covered due to space limitations.	
6-116	A	15	13	15	20	Cogeneration is also important for heating and hot water supply. This section should be moved to other section which deals cooling/heating/hot water heat source. (Yoshiyuki Shimoda, Osaka University)	This section (6.4.4.4) gets deleted.	
6-117	A	15	13	15	20	As well as chillers and heat pumps, the COP of absorption chiller should be shown. "Recently, triple-effect absorption chiller having high COP (=1.6) has been developed."	This section (6.4.4.4) gets deleted.	

Deleted: Danny to get copy of and check it.

Formatted: English (U.S.)

Deleted: No space.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						Reference: http://www.jarn.co.jp/News/2005_Q4/51213_Kawasaki_Triple.htm Mori, K., M. Oka and T. Ohhashi, 2003: Development of Triple-effect Absorption Chiller-Heater, World Gas Conference 2003 (Yoshiyuki Shimoda, Osaka University)		
6-118	A	15	13	15	20	COMMENT: There are many kinds of generators such as gas engine beside of micro gas turbine and Fuel Cell. Recently, high generating efficiency gas engine was newly developed and introduced as distributed generator. (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	This section (6.4.4.4) gets deleted.	
6-119	A	15	13	15	20	There are many kinds of generators such as gas engine beside of micro gas turbine and Fuel Cell. Recently, high generating efficiency gas engine was newly developed and introduced as distributed generator. (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	This section (6.4.4.4) gets deleted.	
6-120	A	15	17			the statement that fuel cells may become economically attactive for cogeneration is higly speculative. Due to the changing demand for heat, cooling and power, heat pumps are expected to become the dominant technology in offices (Harm Jeeninga, ECN)	This section (6.4.4.4) gets deleted.	
6-121	A	15	26	15	26	The need (or not) for energy-efficient houses to be 'air-tight' weill depend on the climate. In some climates excellent living conditions can be achieved by very leaky houses (Nigel Isaacs, BRANZ Ltd)	**Accepted.**	**Danny t point.**
6-122	A	15	50			After "North America" on line 47, the following text should be added; "Significant improvement has been achieved over the past 10 years in Japan. Variable speed compressor technology realized improvement of efficiency under the part load condition which is occurring very often in moderate climate. DC inverter-driven variable compressor speed control enabled very high COP level. By using VRV (Variable Refrigerant Volume) technology, direct expansion type multi-split air conditioners brought about high efficiency under the variable load condition. (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	**Accepted, if the figures and references can be found.**	Hiroshi
6-123	A	16	38	17	22	Mini split type room air conditioner is widely used in Asian countries (especially in Japan and China) and its cooling COP ranging from 4.5 to 6.2 (2.8 kW class). THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE K. Kusakari, Marketing & Customer Relations Dept., The Tokyo Electric Power Company, Tokyo, Japan□IEA 8th IEA HP CONFERENCE 2005□ (Shinichi Nakakuki, Tokyo Electric Power Company)	**Accepted, if the figures and references can be found.**	Hiroshi

Deleted: Danny to rephrase in order to acknowledge this point.

Formatted: English (U.S.)

Deleted: Do it. Try to get specific numbers from reviewer.

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Deleted: Similar to comment above.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-124	A	16	38			COMMENT: Mini split type room air conditioner is widely used in Asian countries(especially in Japan and China) and its cooling COP ranging from 4.5 to 6.2 (2.8 kW class). REFERENCE: K. Kusakari et al., THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE, IEA 8th IEA HP CONFERENCE 2005 (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Noted, but cannot be included due to space limitations.	
6-125	A	16	38			Mini split type room air conditioner is widely used in Asian countries(especially in Japan and China) and its cooling COP ranging from 4.5 to 6.2 (2.8 kW class). REFERENCE: K. Kusakari et al., THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE, IEA 8th IEA HP CONFERENCE 2005 (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Noted, but cannot be included due to space limitations.	
6-126	A	16	40	16	42	There are many 'new' prototypes for different uses around the world - is this really relevant in an IPCC report? (Nigel Isaacs, BRANZ Ltd)	**Will surely disappear when report is shortened.**	
6-127	A	17	21	17	22	Maintenace of air-to-air, or other source, heat exchangers is critical to their performance in buildings as opposed to test regimes and laboratories. (Nigel Isaacs, BRANZ Ltd)	**Accepted. Mention this if section is retained.**	Danny
6-128	A	17	25	17	27	Mini split type room air conditioner is widely used in Asian countries (especially in Japan and China) and its cooling COP ranging from 4.5 to 6.2 (2.8 kW class). HEAT PUMPING TECHNOLOGIES IN ASIA AND THE PACIFIC: AN OVERVIEW□Takeshi Yoshii, Heat Pump & Thermal Storage Technology Center of Japan, Tokyo, Japan Wei Xu, China Academy of Building Research, Beijing, China□IEA 8th IEA HP CONFERENCE 2005□ (Shinichi Nakakuki, Tokyo Electric Power Company)	Noted, but cannot be included due to space limitations.	
6-129	A	18	30	18	44	This paragraph has too much description on the cost saving. Energy saving effect of control system should be emphasized. (Yoshiyuki Shimoda, Osaka University)	Noted. We will consider if and how this can be addressed in the limited space.	Geoff to
6-130	A	19	20	19	26	Good 'baseline' data is lacking for all building types in almost all countries (developed or developing) (Nigel Isaacs, BRANZ Ltd)	Noted. True, but no change needed.	
6-131	A	19	38			For years, we have been trying to develop standards, but technology is changing more rapidly than we can develop standards (Harm Jeeninga, ECN)	Accepted. We will consider if and how this can be addressed in the limited space.	Geoff to

Deleted: Redundant comment.

Deleted: Redundant comment.

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Deleted: Redundant comment

Deleted: Geoff to decide on response

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Deleted: Geoff to decide on response

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-132	A	19	51	20	9	Japanese government is promoting the introduction of high efficiency water heater such as CO2 heat pump and condensing boiler for residential and commercial buildings. The COP of CO2 heat pump is improving year by year. THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE K. Kusakari, Marketing & Customer Relations Dept., The Tokyo Electric Power Company, Tokyo, Japan□IEA 8th IEA HP CONFERENCE 2005□ (Shinichi Nakakuki, Tokyo Electric Power Company)	**Noted, if the report can be made available.**	**Hiroshi**
6-133	A	19	51	19	52	Before the discuss the water efficiency, discussion on necessity of hot water for clothes washing and dish washing is necessary. Description of Water-saving shower head is more appropriate. (Yoshiyuki Shimoda, Osaka University)	**Accepted**	Hiroshi
6-134	A	19	51	20	9	COMMENT: Japanese government is promoting the introduction of high efficiency water heater such as CO2 heat pump and condensing boiler for residential and commercial buildings. The COP of CO2 heat pump is improving year by year. REFERENCE: K. Kusakari et al., THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE, IEA 8th IEA HP CONFERENCE 2005 (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Noted, but cannot be included due to space limitation.	
6-135	A	19	51	20	9	Japanese government is promoting the introduction of high efficiency water heater such as CO2 heat pump and condensing boiler for residential and commercial buildings. The COP of CO2 heat pump is improving year by year. REFERENCE: K. Kusakari et al., THE PRESENT STATUS AND FUTURE VIEW OF THE CO2 REFRIGERANT HEAT PUMP WATER HEATER FOR RESIDENTIAL USE, IEA 8th IEA HP CONFERENCE 2005 (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Noted, but cannot be included due to space limitations.	
6-136	A	19	53	20	9	The CO2 heat pump is one of the example of more efficient water heaters (Shinichi Nakakuki, Tokyo Electric Power Company)	**Accepted.**	**Danny:** resistanc alternati from ren
6-137	A	19	54	20	5	As well as section6.4.3.2.1(Heating systems used primary in industrialized countries), condensing type instantaneous gas boiler has high efficiency for residential hot water use. A condensing type instantaneous gas boiler which recovers latent heat from exhaust gas for the pre-heating of water has also been put to practical use. The results of laboratory experiments show the efficiency of a	**Danny to check this paper.**	

Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Formatted: English (U.S.)
Deleted: Danny to seek copy of report. Otherwise, can't add anything.
Deleted: Mention cold-water washing if this section is retained.
Deleted: Redundant comment.
Deleted: Redundant comment.
Deleted: Add: use of heat pumps in place of electric-resistance water heaters where non-electric alternatives are not available or electricity comes from renewable energy sources.

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						condensing type water heater is about 14% higher than that of a conventional system. Reference: Wang, X., M. Mae, S. Iwamoto and M. Kamata, 2004: Examination on a thermal efficiency and heat loss of hot water supply system in dwellings, J. Environmental Engineering (Transactions of AIJ), 580, pp.61-68 (Yoshiyuki Shimoda, Osaka University)		
6-138	A	20	3	20	3	After "reduce the chiller COP)" on line 3, add the following text; " 6) use of heat pump systems using outdoor air souce in moderate climate, e.g. the heat pump water heater using carbon dioxide refrigerant which has recently been developed in Japan." and then change the next item No. from 6) to 7). (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	Prefer not to mention, because savings (if any) depends on efficiency of electricity generation and (for CO2) the fuel source	
6-139	A	20	5	20	6	Prior to discuss the use of exhaust ventilation air and exhaust heat from chiller as heat source of heat pump, the use of heat pump for domestic hot water supply must be addressed since residential heat pump water heater is not common in most of the countries. An air source heat pump water heater, using CO2 as a working fluid, has already been put into practical use in Japan. The seasonal COP of the prototype system is estimated at 3.4 and the COP of the latest model at 4.2. Reference: Saikawa, M., K. Hashimoto, M. Itoh, H. Sakakibara and T. Kobayakawa, 2001: Development of CO2 heat pump water heater for residential use, Trans of the JSRAE, 18-3, pp.225-232 (Yoshiyuki Shimoda, Osaka University)	Noted, will encorporate if space permits	Danny to
6-140	A	20	11	20	42	An important side effect of efficient lighting is that it reduces the internal heat load (so less cooling is needed) (Harm Jeeninga, ECN)	Noted, will add this point if space permits.	
6-141	A	20	11	20	42	The efficiency of LED lighting is now almost as good as that of fluorescent lights. It is predicted that the efficiency of LED technology will be improved even more and that they will become better than fluorescent lights in the near future. (Yoshiyuki Shimoda, Osaka University)	Noted, will add a line on LEDs if space permits.	Mark po also to dig t sentences.
6-142	A	20	13			High efficiency lighting, fluorescent and sodium vapor. (Steven Freedman, Energy Consultant)	Noted.	
6-143	A	20	14	20	14	replace "with sensors and controls to dim" with "with occupancy and daylight sensors to dim and switch off" (Bernard Aebischer, CEPE/ETHZ)	Accepted	Danny to ch
6-144	A	20	16	20	42	The terms T5, T12, T8, CFL are well used and necessary, but should be complemented by a simple illustration. The terms are meaningless to all but the specialist reader, but are likley to be within the prompted knowledge of most	Rejected. Not enough space for more figures, and it involves singling out one set of technologies of the many	Danny to altogether w see if glossa

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						readers. (Nigel Isaacs, BRANZ Ltd)	discussed in the chapter.	
6-145	A	20	17	20	21	LED lamp and inverter lamp are the good example of high efficient lamp. (Shinichi Nakakuki, Tokyo Electric Power Company)	Noted.	
6-146	A	20	18	20	18	replace "The T5 fluorescent" with "If used with electronic ballasts the T5 fluorescent" (Bernard Aebischer, CEPE/ETHZ)	Rejected.	
6-147	A	20	20	20	20	replace "older T8 lamps" with "older T8 lamps with magnetic ballasts" (Bernard Aebischer, CEPE/ETHZ)	Rejected (too much technical detail)	
6-148	A	20	26	20	26	replace "can be used" with "can be used (Jakob et al 2006a)" (Bernard Aebischer, CEPE/ETHZ)	Noted.	Danny to
6-149	A	20	30	20	30	replace "[ref]" with "[Jakob et al 2006]" (Bernard Aebischer, CEPE/ETHZ)	Noted.	Danny to
6-150	A	21	19	21	19	replace "Li and Lam. 2003)." with ", Jakob et al 2006, Li and Lam. 2003). Thus, the importance of an appropriate architectural building design with favourabvle glazing to floor area ratio (15% to 30%)" (Bernard Aebischer, CEPE/ETHZ)	Noted.	Will prob several othe
6-151	A	21	20	21	20	replace "reduction on cooling loads" with "reduction on cooling loads and an increase of thermal comfort" (Bernard Aebischer, CEPE/ETHZ)	Rejected. Goes beyond focus of the paragraph in question.	
6-152	A	21	51	22	15	Other than cloth-washing machines and refrigerator, there is other energy efficiency progress in home appliances. For example, IH (Induction Heating) cooker and gas cooking stove with high efficiency inner flame gas burner shows high energy efficiency compared than conventional cooking appliances. In addition, LCD TV set consume less energy than conventional TV set.. (Yoshiyuki Shimoda, Osaka University)	Noted. Will incorporate if space permits and if references can be found that confirm the statements made by the reviewer.	Hiroshi t
6-153	A	22	6	22	6	replace "(Roth et al., 2002)" by "(Cremer et al., 2003; Roth et al., 2002) (Bernard Aebischer, CEPE/ETHZ)	Noted, will check reference.	Danny to include if w
6-154	A	22	9	22	15	Comment: consider including some information about best appliances (refrigerators/freesers and others) in Europe (Asia?), which may be (only partly because of smaller size!) 50% more efficient than best equipment on the US market! (Bernard Aebischer, CEPE/ETHZ)	Noted, would like to include such information if references with data can be found.	Danny to co Watt Unive able to dig u Danny to as
6-155	A	22	14	22	14	The size of standard US size refrigerator should be mentioned. It seems to be much larger than the world-wide average.	Rejected.	

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						(Yoshiyuki Shimoda, Osaka University)		
6-156	A	22	17	22	19	We are in process of finalising standby energy use data from the only whole-country study, but the NZ Household Energy End-use Project (HEEP) Year 9 report estimates nationally 12% of residential standby electricity is due to refrigeration appliances while 51% is due to entertainment appliances. Source: p 74, Year 9 HEEP report from web page www.branz.co.nz/main.php?page=HEEP. A peer reviewed paper will be presented at ACEEE Summer Study in Monterey in August 2006. (Nigel Isaacs, BRANZ Ltd)	Accepted, will incorporate if space permits	Danny to to try to get at the 2006 into the SO
6-157	A	22	21	22	21	replace "inefficient power supplies" with "inefficient power supplies (Aebischer and Huser, 2003; Calwell and Reeder, 2002) (Bernard Aebischer, CEPE/ETHZ)	Accepted (we need refs here!)	
6-158	A	22	23	22	24	correct "… has caused this equipment to be responsible for most of electricity demand growth …" by something like "…. Has caused that the electricity demand growth of this equipment group is the fastest of all equipment groups …". Comment: In the Swiss residential sector the largest fraction of electricity demand growth in the last ten years is coming from lighting. It is unclear whether standby losses are increasing or decreasing in industrialised countries (Bertoldi et al., 2002) (Bernard Aebischer, CEPE/ETHZ)	Accepted, but we correct that statement by replacing “most” with “a large fraction”	Danny to
6-159	A	23	14	23	16	Please check the assumption in estimation of the potential for power production from Building integrated photovoltaic.Ranging from about 15%(Japan) to almost 60%(USA) of present total electricity demand seems to be over estimated. (Shigeo Murayama, The Federation of Electric Power Companies)	Noted. The statement is indeed a correct report of what the stated reference says.	Danny to ch Geoff.
6-160	A	23	18	23	35	Solar thermal collector for hot water is inexpensive than PV. Cost of solar thermal energy should be referred here in a similar way as PV. (Shuichi Miura, Tohoku university of art & design)	Accepted.	Danny to pr of solar ther
6-161	A	23	39	24	53	High efficiency district heating and cooling equipped with heat pump and thermal storage system is commercially available in Japan. THE HARUMI-ISLAND DHC SYSTEM (Ryuji Yanagihara, Akira Okagaki and others) (THE SOCIETY OF HEATING, AIR-CONDITIONING AND SANITARY ENGINEERS OF JAPAN, (Shinichi Nakakuki, Tokyo Electric Power Company)	Accepted. Will add this reference if it can be otained and checked first.	Hiroshi to t Danny.
6-162	A	23	39	23	53	District heating by biomass is increasing in Sweden, Finland, Austria and other countries. Not only solar energy but also biomass energy for district heating should be referred here.	Accepted. Will mention this in the last paragraph of this section.	Danny to ac district heat waste as an

Formatted: English (U.S.)

Formatted: English (U.S.)

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						Reference: Swedish Energy Agency, Energy in Sweden 2004 (Shuichi Miura, Tohoku university of art & design)		
6-163	A	24	25	24	27	The mechanism why the district heat system is more efficient than on-site system must be clarified. For example, "Concentration effect of the load", "Economy of Scale of refrigerator and boiler" and "Grade of operation and maintenance" of THC are important factors of energy efficiency. Reference: Shimoda, Y., T. Nagota, N. Isayama and. M. Mizuno 2005: Verification of energy efficiency of district heating and cooling system using realistic parameters, Proceedings of the Ninth International IBPSA Conference (Yoshiyuki Shimoda, Osaka University)	Accepted. Will check this paper and incorporate a reference if space permits after shortening the chapter.	Danny te
6-164	A	24	39	24	41	This sentence is not related to global warming mitigation. (Yoshiyuki Shimoda, Osaka University)	Rejected. (cost is very relevant)	
6-165	A	24	43	24	45	In addition to use of renewable source, there are another advantages of thermal energy storage that is the improvement of part load operation of the chiller. (Yoshiyuki Shimoda, Osaka University)	Rejected (distracts from the theme of the paragraph)	
6-166	A	25	6	25	6	There is no information of the amount of energy consumption in buildings classified by use (How much energy is used for heating, cooling, hot water supply and other appliances). Of course, it is impossible to estimate world-wide energy consumption in buildings, but some statistics for many countries and regions must be exist. This kind of information is indispensable to discuss what kind of technology is important for global warming mitigation. (Yoshiyuki Shimoda, Osaka University)	Accepted. We attempted to do this, but so far the information has not been found. An attempt will be made for the SOD to do this.	Diana/M
6-167	A	25	24			A sentence should be added saying "Although a number of studies have examined the carbon benefits associated with using low-carbon building materials and systems, few have attempted to estimate the overall mitigation potential. Buchanan and Levine estimated that New Zealand's national emissions could be reduced by 132,000 tonnes of CO2 per year (1.8% of national emissions) if the use of wood in buildings was increased by 118,000 m3 per year (an increase of 17%). (Source, Buchanan and Levine, "Wood-based building materials and atmospheric carbon emissions,." Environmental Science and Policy 2 (1999) 237-437.) Also, it has been estimated that in Europe, if wood consumption was increased by 4% every year, by 2010 an additional 1.5 billions of tonnes of CO^2 stored in wood products would be removed from the atmosphere. Avoided emissions related to displacing more carbon-intensive materials would be in addition to these carbon sequestration benefits. (Source, European Commission Enterprise DG Unit E.4, "Comprehensive Report 2002 - 2003 regarding the role of Forest products for climate change	Study will be added to the database if it is made available. Then sentence will be considered, but probably too much for specific study. Partly accepted.	Diana

Formatted: English (U.S.)

Deleted: Is not relevant for this section.¶
Information is not available on the international level. Rejected.

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						mitigation," January 2004.)" (Reid Miner, NCASI)		
6-168	A	28	20	28	20	The wooden houses contribute to the reduction of CO2 emission by the carbon fixation in the construction materials. The reduce use of the iron and the concrete that emit much higher CO2 than the wood in the production process also contribute to the reduction of CO2 emission. The authors should refer to that the amount of CO2 reduction potential by these effects is huge. (Yoshiyuki Shimoda, Osaka University)	Embodied energy use will be included in section 6.4. Noted.	Da nny
6-169	A	28	22	28	30	While the terms co-benefits and ancillary benefits are used interchangeably, they have different meanings. The TAR (WG III, Pg. 708) defines ancillary benefits as "The ancillary, or side effects, of policies aimed exclusively at climate change mitigation." Co-benefits are defined (WG III, Pg. 711) as "the benefits of policies that are implemented for various reasons at the same time -- including climate change mitigation ..." This section correctly observes that co-benefits are important for policymakers. It would be useful to define co-benefits as support for this observation. (Lenny Bernstein, L. S. Bernstein & Associates, L.L.C.)	We will check the section for consistent wording. Accepted.	Sev
6-170	A	28	32			Chapter 11 (11.8.2-11.8.4 starting on p.56) , as the summarizing chapter is the most logical place to discuss this issue extensively, with chapter 4-10 concentrating on (preferably quantified) co-benefits of specific measures in the sector. Ch 6: p28. 6.6.1 can be shortened to about the first two sentences and the last two lines, with a reference to ch 11. (Peter Bosch, IPCC TSU WGIII)	Rejected. It is important for our chapter and policy relevant.	
6-171	A	28	34		40	An interesting case study from China on co-benefits of heating choices in residential and commercial buildings is Heidi E. Staff Mestl, Kristin Aunan, Fang Jinghua, Hans Martin Seip, John Magne Skjelvik and Haakon Vennemo, 2005, "Cleaner production as climate investment – integrated assessment in Taiyuan City, China", Journal of Cleaner Production, 13, 57-70. (Haakon Vennemo, ECON)	Accepted. Will be taken into account.	Sev
6-172	A	28	51	29	11	The indoor environments quality of developing countries are still in poor conditions. The economic growth of developing countries may cause the increase of energy consumption in spite of improvement of energy efficiency of appliances. (Yoshiyuki Shimoda, Osaka University)	Accepted We will pay more attention to this topic (cooking and heating).	Monga
6-173	A	29	11	29	11	replace "[ref]" with "or even exceed it (Banfi et al 2005, Jakob et al 2006b)" (Bernard Aebischer, CEPE/ETHZ)	Accepted.	
6-174	A	29	33	29		Text Box 6.1:	Noted.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						I suggest to change the text in the box to the following and include the additional references listed below: Tourism has a significant role in the context of climate change mitigation in some parts of the world due to its economic importance as well as its high energy consumption. In many countries tourism contributes significantly to national energy demand, for example in the order of 6% (New Zealand, Becken & Simmons, 2005) to 8% (in Fiji, Becken, 2004). The growth of tourism inevitably fuels energy demand growth for hospitality services (Tulsie, 2001). One visitor night in a hotel, for example, consumes between around 200 MJ of energy, depending on building design, service level and climate (Becken et al., 2001). The energy demand is typically met by electricity and in some instances by gas for heating and cooking. In the tourist attraction sub-sector, Becken and Simmons (2002) found that built tourist attractions, such as museums, are comparatively energy efficient. In contrast, activities that involve some form of transport, for example scenic boat trips or ecotourism tours, stood out as very energy intensive. Special policies optimized at mitigating GHG emissions in catering, entertainment, and lodging facilities may be warranted in many parts of the world, especially where tourism is a main contributor to the economy. Many tourism facilities within the Wider Caribbean region suffer from inappropriate energy use models transferred from temperate areas without suitable modification to local climate and other circumstances. Numerous measures are available, often at low or no cost, to reduce energy waste and hence cut carbon emissions from the tourism sector. Examples include signage and notes to remind tourists to participate in energy conservation by moderate use of hot water, maintaining moderate air-conditioning operation, using of natural ventilation and passive solar architectural solutions, installation of solar water heaters, designing hotels and resorts with open-air (non-conditioned) public spaces, keycard-enabled power supply in rooms, motion detectors for room and corridor lighting, re-engineering of kitchen areas, and low-energy or solar-powered lighting (e.g., for pathway lights) (Island Resources Foundation, 1996). It is important to recognise that almost all measures that can reduce carbon-dioxide emissions in tourist establishments improve comfort and amenity and reduce operating costs, therefore fostering the competitiveness and attractiveness of the facility for clients. Hence, policies and measures to help the development of the tourist industry can go hand-in-hand with GHG emission reduction initiatives. Becken, S., Frampton, C. & Simmons, D. (2001). Energy consumption patterns in the accommodation sector – the New Zealand case. Ecological Economics, 39 (3),	But we will completely remove the text box due to space limitations. Sorry.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						371-386. Becken, S. & Simmons, D. (2002). Understanding energy consumption patterns of tourist attractions and activities in New Zealand. Tourism Management 23 (4), 343-354. Becken, S. (2004). Climate change and tourism in Fiji. Vulnerability, adaptation and mitigation. Final Report. University of the South Pacific, Suva, Fiji. Becken, S. & Simmons, D. (2005). Tourism, fossil fuel consumption and the impact on the global climate. In Hall, M. & Higham, J. (eds.) Tourism, Recreation and Climate Change: International Perspectives. Chapter 14. Clevedon: Channel View Publications. Becken, S. (2004). Climate change and tourism in Fiji. Vulnerability, adaptation and mitigation. Final Report. University of the South Pacific, Suva, Fiji. (Susanne Becken, Landcare Research)		
6-175	A	30	32			The EC estimates large employment effects due to the reduction of energy consumption. However, (Jeeninga et al, 1999) as well as (Kapros/NTUA, 1999 - same Employment study) find the the net impacts are very small (though positive), although on a sectoral level significant changes can be found. (Harm Jeeninga, ECN)	Accepted. Studies will be checked and fully acknowledged.	Sev
6-176	A	30	48			The conclusion not only holds for former East European countries but also for the rest of the world (specifically when disposable income is low) (Harm Jeeninga, ECN)	Rejected. Caused by subsidy removal which is specific for former communist countries.	Formatted: English (U.S.)
6-182	A	31	0	38		As section 6.7 notes, there are many different classifications of barriers and there is a risk of getting lost in the detail. The Carbon Trust analysis suggests a high-level classification of barrier-drivers into four categories: financial cost/benefit; hidden cost/benefit; real market failures; and behavioural / organisational non-optimalities (associated with behavioural characteristics of indivuduals and the organisational characteristics of large organisations). From a policy and economic perspective this is useful because it clarifies why and where net gains could be expected by targeting policy at these different classes (eg, role of product standards in avoiding transaction costs, etc). This analysis also forms the basis of the Carbon Trust proposal for commercial sector building energy use. See Carbon Trust, 'The UK Climate Change Programme: potential evolution for business and the public sector' , www.carbontrust.co.uk, which embodies not only results of the Carbon Trust's main policy analysis for the UK government but also draws on the Trust's extensive experience of energy and carbon management with commercial organisations (Part	Noted. We will check the study and reconsider. Maybe could add this as a summary table. Also consider this as a way of space-saving.	Monga

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						1.2, Part 2) (Michael Grubb, Cambridge University)		
6-177	A	31	33	31	34	replace "Jakob et al 2002" with "Banfi et al 2005, Jakob et al 2006b, " (Bernard Aebischer, CEPE/ETHZ)	Accepted.	
6-178	A	31	40			6.7 mainly addresses developed countries, countries in transition and developing countries also need to be described (Harm Jeeninga, ECN)	Noted. We will do our best, but limited literature available.	Monga
6-179	A	31	40	37		In Section 6.7, not enough is said about the problems created by the disjointedness of the supply chain. Many buildings are built by developers who have no prior relationship with the final owners and occupiers. The primary focus of the developer is minimising first cost and this often leads to poor levels of energy efficiency investment – despite the potential longevity of the building itself. Although most comments on cost-effectiveness in the chapter refer to a whole-life cost assessment (the normal policy measure), it should be stressed that the construction industry rarely works on this basis. This is a clear barrier to the further realisation of potential savings. (Paul Ashford, Calebgroup)	Accepted. Topic is indeed relevant, but we depend on adequate literature.	Geoff
6-180	A	31	40	32	15	Mention should be made of the important influence of city patterns in energy consumption. Suggeste insert : 'Consumption of energy varies according to the density and shape of habitat, with the less dense consuming more for heating. Traisnel et al. measured a factor of two on representative samples of housing spread between the center of Paris and the suburbs. Source : Traisnel J.P., Peuportier B., Bornarel A..2001, "habitat et développement durable", in CLIP N 13 IDDRI Paris.' Note : CLIP (Club d'Ingénierie Prospective Energie) is commissioned by the largest applied energy research labs in France, public and private. Available on line on http://www.iddri.org/iddri/html/publi/cahiers-du-clip.htm (Antoine BONDUELLE, E&E_Consultant)	Rejected. Does not fit in our barriers framework (is not a barrier but just an unfavourable condition)..	
6-181	A	31	53	32	14	Need more research on IDP so that its gain could be tangibly estimated. Main reason that IDP is not so popular is, aside lack of information, building deigning cost. If one can show the benefit from IPD is larger than the cost of adopting IDP, it would help a lot for IPD to spread around. (Yoon-Young Kang, Korea Energy Economics Institute)	Noted. But will be treated in section 6.4	Danny
6-183	A	32	18	22	35	The 'traditional' design process is not that described here - this is the design process that has become the norm, but traces back only in the decades not centuries. The issues raised in this section can be relate to the 'compartmentalisation' of the development,design, costing, construction, commissioning, operation and	Accepted, see comment 179.	Sev

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						occupation of buildings in recent times. The end-users have become separated from the process that creates the building they live or work in. See: Baird G, Gray J, Isaacs N., Kernohan D & McIndoe G (ed.) 1996 Building Evaluation Techniques 207 pp New York: McGraw Hill (Nigel Isaacs, BRANZ Ltd)		
6-184	A	33	37	33	52	The authors are right to say "the experience with VA has been mixed". However, the same goes to any governmental policy hence sigling out VA and making judgement is single sided. The problem I see is that VA's are seriously critisized while tax, cap and trade and any other policy instruments are not in this chapter. I suggest to modify the wordings as follows: "the experience with VA has been mixed as that with any other policy instruments has" (Taishi Sugiyama, CRIEPI)	Rejected. Does not refer to this section and we are very balanced about VA. Will check with Sugiyama	Diana
6-185	A	33	48	33	52	There are many successful VA's that are NOT legally binding. Japanese pollution control agreements were powerful tool to control emissions from stationary sources. See: Kitamura, Yoshinobu (2003) "Local Environmental Low and Policy 3rd ed."(in Japanese); Terao, Tadanori (1994) "Industrial Policy and Industrial Pollution in Japan", in "Development vs. Environment" Kojima and Shinozaki eds., The Institute of Developing Economies (in Japanese), Chapter 8. Moreover, is should be noted that legal nuiance differ across countries. Japanese pollution control agreements, as well as top-runner standards for electric appliances, are "voluntary" legally, but there are strong compliance in reality. Nominal difference as to if legally-binding or not is irrelevant with compliance records - and effectiveness of policy instruments generally. (Taishi Sugiyama, CRIEPI)	Rejected. See previous	
6-186	A	33	53			Add a sentence saying, "In some cases, building codes unnecessarily prevent the use of building materials and systems that have lower embodied GHG emissions, even though these materials provide comparable thermal performance to alternative systems. (Reid Miner, NCASI)	Noted. No evidence for this statement. But in general attention for embodied energy is OK, see additions in section 6.4	
6-191	A	34	0			The Australian 'town' of Canberra (ACT) has had a requirement for all houses to be rated on sale. The impact on the market has been to place a financial value on energy efficiency through a well informed market place as purchasers are provided with a measure of the space heating/cooling cost benefits. For more information see web site http://www.actpla.act.gov.au/design-guide/acthers/eer_sell.htm (Nigel Isaacs, BRANZ Ltd)	Accepted. Will be treated in secton 6.8	Kornelis
6-187	A	34	18	34	23	This statement is a statement of fact, concerning small scale projects (not just	Accepted. This will be discussed.	Diana

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						small-scale energy efficiency projects), and their high transaction costs for the amount of credits that can be earned. As I stated above, perhaps the solution is to make a large package of such energy efficiency projects together under a single programme, either proposed by the private sector or the government, to take advantage of the decision reached by the COP/MOP in Montreal. In the advanced unedited version of the decision entitled "Further guidance relating to the clean development mechanism," the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, ... "20. Decides that a local/regional/national policy or standard cannot be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity provided that approved baseline and monitoring methodologies are used that, inter alia, define the appropriate boundary, avoid doublecounting and account for leakage, ensuring that the emission reductions are real, measurable and verifiable, and additional to any that would occur in the absence of the project activity." This decision can be found on the COP web site. The decision appears to be interpretable as allowing for, as an example, a package of energy efficiency projects in buildings, conducted under a private sector or government program, This decision, updating the current text, should be recognized explicitly by the authors. (Arthur Lee, Chevron Corporation)		
6-188	A	34	18	34	23	This statement is a statement of fact, concerning small scale projects (not just small-scale energy efficiency projects), and their high transaction costs for the amount of credits that can be earned. Perhaps the solution is to make a large package of such energy efficiency projects together under a single programme, either proposed by the private sector or the government, to take advantage of the decision reached by the COP/MOP in Montreal. In the advanced unedited version of the decision entitled "Further guidance relating to the clean development mechanism," the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, ... "20. Decides that a local/regional/national policy or standard cannot be considered as a clean development mechanism project activity, but that project activities under a programme of activities can be registered as a single clean development mechanism project activity provided that approved baseline and monitoring methodologies are used that, inter alia, define the appropriate boundary, avoid doublecounting and account for leakage, ensuring that the	Same as previous.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						emission reductions are real, measurable and verifiable, and additional to any that would occur in the absence of the project activity." This decision can be found on the COP web site. The decision appears to be interpretable as allowing for, as an example, a package of energy efficiency projects in buildings, conducted under a private sector or government program, This decision, updating the current text, should be recognized explicitly by the authors. (Andrei Marcu, IETA)		
6-189	A	34	30	34	54	The 'perfect' marketplace assumes perfect information is available to all participants. This is clearly not the case with respect to building energy use, where often no particpant has good quality data on the hows, wheres, whens and whys of energy use. The section should explicity state that there is an urgent need for good quality end-use data top match the supply-side data that is readily available in almost all economies. Even the example in Box 6.2 is not yet supported by actual end-use data. (Nigel Isaacs, BRANZ Ltd)	Accepted. Point on mission end-use data will be taken up in R&D section.	Diana
6-190	A	34	38	34	40	It is better to delete this paragraph since this example is not appropriate specifically for Japanese Utilities. Japanese Utilities inform households not only the volume of electricity consumption,but also those of the same month in last year in monthly electricity bill to encourage households to use electricity efficiently. (Shigeo Murayama, The Federation of Electric Power Companies)	Rejected. The term typically already allows exeptions.	
6-192	A	36	27	36	41	Implementation of summer time should be mentioned here. (Shuichi Miura, Tohoku university of art & design)	Rejected. Too much detail.	
6-194	A	38	0			Section 6.8.1 needs to be expanded to address the policies and programs that are needed to increase the use of low-carbon building materials and systems thay provide comperable performance to alternative systems during occupancy. (Reid Miner, NCASI)	Noted. It is not unreasonable to plea for embodied energy inclusion in building codes, but no literature available on how this should be done.	
6-193	A	38	51	38	51	Include a section about building codes regarding electricity demand. You may use the following information: " SIA, the Swiss association of engineers and architects, has developped recommendations (minimum and target requirements) for specific installed electric loads (W/m2) for lighting and for ventillation/cooling in new commercial buildings (SIA, 2006). The recommendations are defined for specific usage of the area, e.g. office with low, mean, high internal loads; conference rooms, schools, corridors, etc. Several Cantons are using these recommendations as mandatory requirement in their energy law. (Bernard Aebischer, CEPE/ETHZ)	Accepted. We will mention it.	Kornelis

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
6-195	A	39	5	39	24	Please add the following sentence in this paragraph: Housing performance indication system which indicates energy saving performance has been introduced in Japan since 2000. Reference: http://www.sumai-info.jp/seino/index.html (in Japanese) (Yoshiyuki Shimoda, Osaka University)	Accepted, if this is a real scientific document.	
6-196	A	39	5			It would be of greater effect if one can quantify economic benefits between building labels. (Yoon-Young Kang, Korea Energy Economics Institute)	Noted. Is there literature?	
6-197	A	39	19	39	24	Please add the following sentence in this paragraph: CASBEE (Comprehensive Assessment System fir Building Environmental Efficiency) in Japan has been applied in the mandatory scheme in several local governments. Reference: http://www.ibec.or.jp/CASBEE/english/index.htm (Shuichi Miura, Tohoku university of art & design)	Accepted. Will be considered.	Kornelis
6-198	A	39	25	39	25	In Switzerland, the "Minergie"-label is supported by the cantons as well as the Confederation. New buildings meeting the Minergie technical specifications consume about 50% less energy than buildings fullfilling the mandatory requirements and require roughly 6% additional investment costs. A few cantons subsidise construction that complies with the Minergie standard and some banks offer special mortgage conditions if a property complies with the Minergie standard. The Confederation has decided that all buildings constructed or subsidised by the Confederation must aim to comply with the Minergie standard. (IEA, 2003) (Bernard Aebischer, CEPE/ETHZ)	Accepted. Will mention.	Kornelis
6-199	A	39	26	39	37	Japanese architectural education system is holistic. (Shuichi Miura, Tohoku university of art & design)	Noted. Lack or reference.	
6-200	A	39	26	39	37	Education of energy saving not only for expert and specialist but also for general citizen is important. Model school teaching energy saving is increasing in Japan. 50/50 project which restore the budget by saving energy cost at school is conducted in Germany and shows successful results. Reference: http://www.hamburger-bildungsserver.de/klima/fifty/brosch/ http://www.eccj.or.jp/school/model/index.html (Shuichi Miura, Tohoku university of art & design)	Accepted. Will be mentioned.	Kornelis
6-201	A	39	26	39	38	Benefit from education and training can be or should be estimated in the future so that it help policy makers. (Yoon-Young Kang, Korea Energy Economics Institute)	Noted, but unfortunately difficult to quantify. Literature unknown.	

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
6-202	A	40	18	40	21	Please confirm that preferential loan schemes for new and existing buildings in Japan by Development Bank of Japan and Japanese Government Housing Loan Corporation are included in the number□. Japan also has capital subsidy programs. Reference: http://www.dbj.go.jp/japanese/loan/indicator/D03.html (in Japanese) (Shuichi Miura, Tohoku university of art & design)	Noted. Will check.	Kornelis
6-203	A	40	46			Section 6.8.2 should address the Clean Development Mechanism. There are some nice examples of CDM projects in the building sector, such as the South African Kuyasa low-cost urban housing energy upgrade project, Khayelitsha (Cape Town). But some relevant methodologies have also been rejected. An analysis should be included here. (Anne Arquit Niederberger, Policy Solutions)	Accepted. Will pay some attention to CDM but relevance for building sector is limited so far.	Diana
6-204	A	41	4	41	50	Japan's 'Top Runner' standard should be described. The following sentence is recommended: Japan imposed tougher energy consumption efficiency standards on equipment by adopting the "Top Runner Program." The Top Runner Program is one way of setting target standard values, which is highest efficiency of equipment currently on the market. As of 2003, Top Runner standards have been established for 18 items including passenger vehicles, air conditioners, fluorescent lights, TV sets, video cassette recorders, copying machines, computers, magnetic disk units, freight vehicles, electric refrigerators/freezers, space heaters, gas cooking appliances, gas water heaters, oil water heaters, electric toilet seats, vending machines and transformers. Energy consumption efficiency values and a rating mark are voluntarily displayed in catalogues and so forth so that consumers can consider energy consumption efficiency when purchasing. Reference: http://www.eccj.or.jp/top_runner/ (Shuichi Miura, Tohoku university of art & design)	Accepted.	Yoshido
6-205	A	41	10	41	50	Japan's 'Top Runner' standard should be described in this paragraph. Japanese "Top Runner Standard" have the distinctive features that the target values are set based on the most energy efficient model on the market at the time of the value-setting process and the weighted average values using shipment volume is used as the target value. Reference: http://www.eccj.or.jp/top_runner/ (Yoshiyuki Shimoda, Osaka University)	Accepted, see previous	
6-206	A	41	31	41	31	Insert the following text; " In Japan, energy efficiency has singnificantly improved after the Energy Conservation Law was enforced, i.e. about 60% improvement was achieved in 2004 compared with 1999 for air conditioners with cooling capacty of 4.0kW or less. Also, the Energy Conservation Labeling is quite effctive in drawing	Accepted	Yoshido

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						users attention to those high efficient products which satisfy the high target values required by the Energy Conservation Law. (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)		
6-207	A	42	8	42	14	the downside of the labelling system is that if the standards are not revised from time to time, than there is no stimulus to the manufacturers to develop more effiicient appliences and the whole market will be abel to deliver appliances fitting the highest efficiency class. In time, this might be even countre productive and efficiency improvement may slow down considerably. (Harm Jeeninga, ECN)	Accepted	Kornelis
6-208	A	44	0	47		I think section 6.8.3 could be considerably strengthened. In terms of commercial sector (I am not qualified to comment on domestic) the key is to recognise the sheer immateriality of energy costs. The evidence is that most companies do not take much notice of building-related energy bills - many dont even know them and certainly dont include them in management procedures. Cambridge Econometrics have estimated the price elasticity to be as low as 0.12. Price instruments on their own therefore have little impact; it is the behavioural and structural barriers that need to be addressed. See Carbon Trust, 'The UK Climate Change Programme: potential evolution for business and the public sector' , Dec 2005, www.carbontrust.co.uk (Parts 1.2, 2.3 and 2.4). (Michael Grubb, Cambridge University)	Accepted. Reference will be added, in addition will streamline treatment of taxes and price elesticities.	Kornelis
6-209	A	45	11	45	26	contains significant repetition from previous section(s) (Harm Jeeninga, ECN)	Noted. We will check.	Diana
6-210	A	46	16	83		Please add the following two items in "Japanese" row: 1)Program Title: The subsidy programs for the condensing boiler and the air source heat pump water heater Type of fiscal measure: Subsidy Techniques: energy efficient appliances 2) Program Title Preferential loan programs for energy efficient housing and buildings. Type of fiscal measure: Preferential loans Techniques: energy efficient housing and buildings (Yoshiyuki Shimoda, Osaka University)	Accepted, if a good literature reference is available and if schemes are substantial.	Yoshido
6-211	A	46	19	46	19	Maybe note in the title that these are credit-based trading systems, this inherently involves transaction costs and limits their ultimate impact, though they may be only option for SME sector (Carbon Trust, 2005 Part 2.4) (Michael Grubb, Cambridge University)	Accepted.	Kornelis

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
6-212	A	46	35	46	38	I think it is not relevante energy savings (FÉLIX HERNÁNDEZ, IEG-CSIC)	Noted. We do unfortunately not understand the comment.	
6-213	A	46	53	46	53	The meanings of "dead-weight factor" is not clear. (Shuichi Miura, Tohoku university of art & design)	Accepted. We will explain.	Kornelis
6-218	A	47	0	47		Section 6.8.3 could consider an insertion or even a short section on allowance trading schemes, such as the Carbon Trust (2005), Part 2.4 proposal for a consumption-based ETS targeted at the commercial sector and analysis of implementation issues in Part 3.2 (Michael Grubb, Cambridge University)	Accepted. Personal carbon allowances will be mentioned.	Geoff
6-214	A	47	30	48	13	Please add the following sentence in this paragraph: NEDO also subsides for the R&D for energy efficiency in residential and commercial buildings in Japan. Japan has also implemented R&D concerning housing design guideline for energy conservation. (MLIT 2002) Reference: http://www.nedo.go.jp/english/index.html (Shuichi Miura, Tohoku university of art & design)	Reject. There are many national programmes and we can unfortunately not treat them in this context.	
6-215	A	47	53	47	54	It is not correct that the characteristic of Japanese R&D is focus on control system and reduction of stand-by electricity. There are variety of R&D is running in Japan (Shinichi Nakakuki, Tokyo Electric Power Company)	Noted. Will check,	Yoshido.
6-216	A	47	53	47	55	It is not correct that the characteristic of Japanese R&D is focus on control system and reduction of stand-by electricity. There are variety of R&D is running in Japan (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Same as previous	
6-217	A	47	53	47	55	It is not correct that the characteristic of Japanese R&D is focus on control system and reduction of stand-by electricity. There are variety of R&D is running in Japan (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Ibid.	
6-222	A	49	0	50		Consider adding inclusion of energy operating costs in evaluating amount and interest rate on mortgages to more honestly evaluate the ability of the mortgagee to pay his financial obligation, than is currently practised. (Steven Freedman, Energy Consultant)	Noted, literature will be consulted and then decided whether it is worth incorporating. Issue is already addressed to some extent in 6.8.3.6.	Kornelis
6-219	A	49	30	49	40	CASBEE should be mentioned in this paragraph Reference: http://www.ibec.or.jp/CASBEE/english/index.htm (Yoshiyuki Shimoda, Osaka University)	Noted. See previous reaction on CASBEE	
6-220	A	49	42	49	49	Please add the following sentence in this paragraph: In Japan □overnment buildings are designed and managed environment-friendly. Environmental assessment and retrofitting has also been implemented. (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)	Noted. No reference available.	
6-221	A	49	42	49	49	Please add the following sentence in this paragraph:	See previous.	

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						In Japan □overnment buildings are designed and managed environment-friendly. Environmental assessment and retrofitting has also been implemented. (MASAHIRO NISHIO, Ministry of Economy, Trade and Industry)		
6-223	A	50	0			Here, it would be nice to mention the Topten product information system, which was launched in Switzerland, but is expanding to 10 EU countries under the Energy Intelligent Europe program, with plans to expand to Latin America and China (www.topten.info). The Topten system makes it possible for procurement programs to specify the most efficient products/equipment currently available on the market (approx. 10 products in each category), rather than all that conform with standards or label schemes, which often lag the pace of innovation. A company or government agency can specify that it will only accept bids for equipment listed on Topten. This approach creates a "market pull" effect at the very top of the energy efficiency performance spectrum and provides an incentive for continuous innovation to manufacturers. The system also provides valuable real-time market data on the efficiency level of the best currently available products, which can inform standard and label programs. These systems are run/financed under a range of models involving government agencies, NGOs and utilities, but require independent testing. (Anne Arquit Niederberger, Policy Solutions)	Noted. Will be considered if space permits.	Kornelis
6-224	A	51	42	51	42	I cannot find the document (Murakoshi et al., 2002) in the references. (Shuichi Miura, Tohoku university of art & design)	Accepted. Will be added	Mark?
6-225	A	52	0			It would be useful to mention the Montreal Protocol in this section. I would suggest, "The implementation of the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer has had a considerable impact on emissions of greenhouse gases from the building sector through the replacement of CFCs in insulating foams and building air-conditioning units with alternatives that have a lower global warming potential. Furthermore, in many cases, the application of new refrigerants for air-conditioning has resulted in an improvement in the energy efficiency of the units. A remaining issue is the recovery and recycling of CFCs and HCFCs from existing equipment and building stock in order to reduce emissions." (Reference: IPCC Special Report on HFCs, 2005). (Nick Campbell (Batch 2), ARKEMA SA)	Noted. Already addressed in 6.8.7.	
6-226	A	52	15			please link section with security of supply (Harm Jeeninga, ECN)	Accepted. Will refer to the issue, but discussion on supply security is warranted in CH4.	Sev
6-227	A	52	15	52	32	Furthermore importance of information supplement for the emission factor of	Noted – but point already addressed in	

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						electricity based on the regional condition should be mentioned. (Shuichi Miura, Tohoku university of art & design)	less detail p. 52 line 25 - 28.	
6-228	A	52	17	52	32	another type of fuel switch which is specifically important for the future is the switch away from natural gas towards a flexible (security of supply) energy carrier without fixed carbon content (emission reduction), such as electricty (heat pumps), heat (district heating) or hydrogen (theoretically?) or biogas / SNG (Harm Jeeninga, ECN)	Accepted. Added sentence: "in the long term, carbon neutral energy carriers may make fuel switching a highly desirable option in buildings."	Formatted: English (U.S.)
6-229	A	52	24	52	24	Latin America has more than 10 trillion m3 natural gas reserves (Torsten Clemens, OMV E&P)	Will be checked	Luis Geng
6-230	A	52	34		40	Is the statement on building technology or general? If not, why mention this here? (Peter Bosch, IPCC TSU WGIII)	Rejected: the issue is important for all sectors, in particular in the buildings sector, so needs to be mentioned.	
6-231	A	52	35	52	40	Because of construction boom in Eastern Europe and former USSR, there is need to support also policies supporting technology transfer to those countries. Today the construction is booming and only cheap and environemnatlly not controlled technology is used. (Rein Ahas, University of Tartu)	*Reject. This is not due to the lack of transferred technolog, but rather lower per capita income levels.*	
6-232	A	53	46			The phrase "local, sustainably harvested" should be removed because it introduces concepts without offering insights. If the term "local" is used to point out the fact that the global effect of using any fuel is affected by emissions from transporting the fuel, then this should be stated explicitly. Likewise, if the second element "sustainably harvested" is introduced to inform the reader that the benefits of biomass fuels can only be sustained if supplies are replenished, then this should be stated. (Reid Miner, NCASI)	Rejected. Sustainably harvested biomass is necessary to avoid net increases in carbon emissions.	Formatted: English (U.S.)
6-233	A	54	12	55	29	The Piexoto and Ashford references are part of the IPCC Special Report on HFCs which carries out a detailed assessment. (Nick Campbell (Batch 2), ARKEMA SA)	REjected – but that does not warrant us not referring to the original source.	
6-234	A	54	19	54	29	The absorption chiller/heater is one of the promising options for replacing air conditioner using CFC and HCFC. (Yoshiyuki Shimoda, Osaka University)	Noted – the whole issue of F-gases is being revisited.	Danny Formatted: English (U.S.)
6-235	A	54	31	54	43	This section is very incomplete and only applies to the EU and does not consider policies and measures that apply to the fluorinated gases in USA, Australia and Japan. It will be possible to write such a section using information contained in the IPCC Special Report on HFCs. Please ask if you wish two paragarphs to be written. (Nick Campbell (Batch 2), ARKEMA SA)	Noted – the whole issue of F-gases is being revisited. However, the issue is discussed in detail in another IPCC report, we just need to refer to it rather go into the details again.	Danny Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
6-236	A	54	31	54	31	Suggest "Existing policies within the EU, are primarily aimed at reducing emissions of F-gas refrigerants through improving containment or banning their use in certain applications." (Nick Campbell (Batch 2), ARKEMA SA)	Noted – will be considered during the reconsideration of the F-gas issue. Also, reference will be needed for this statement.	Danny
6-237	A	54	37	54	37	The word "natural" should be placed in quotations as it only refers to the presence of the gas in the environment; ammonia, CO2 and hydrocarbons are all manufactured by the petrochemical industry. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted.	Danny
6-238	A	54	39	54	44	It is likely that the EU F-gas regulation will have entered into force before the IPCC AR4 is completed. I would suggest that the text is changed to read as follows: "The European Regulation on certain fluorinated gases entered into force in 2006. It covers all stationary refrigeration and air-conditioning equipment with a charge of greater than 3 kgs and requires that operaters maintain a time-specifed maintenance regime and keep a log-book for each piece of equipment. The regulation also sets minimum standards for inspection, requires that personnel servicing equipment are trained and certified. The recovery of refrigerants at the end-of-life is mandated. (Harmelink et al., 2005). (Nick Campbell (Batch 2), ARKEMA SA)	Accepted, will be included.	Danny
6-239	A	54	44			Add the following text at the end; "Furthermore in Japan, the Fluorocarbons Recovery and Destruction Law was established in 2002. (Makoto Kaibara, Matsushita Electric Industrial Co., Ltd.)	Noted, likely included if space permits.	Danny
6-240	A	55	1	55	29	The equivalent CO2 emission can be cut by 62% by using hydrocarbon as one of the non- fluorocarbon foaming agents. Reference: Mizukoshi, T., S. Murakami and T. Ikaga, 2004: Effect of thermal insulation of houses on greenhouse gas emissions focusing on leakage of fluorocarbons, Proceedings of the 6th International Conference on Eco Balance, Tsukuba, Japan (Yoshiyuki Shimoda, Osaka University)	Noted. Probably will be discussed in the technical revision of the F-gases.	Danny
6-241	A	55	7	55	7	HCFC use to produce foam is still permitted until 2040 in developing countries. Suggest: "HFCs are used as blowing agents for the production of certain types of foam insulation. In developed countries, they have been adopted to replace CFCs and HCFCs that are being phased out under the Montreal Protocol." (Nick Campbell (Batch 2), ARKEMA SA)	Accepted.	Danny
6-242	A	55	9	55	10	In Section 6.8.7.2, the assertion is made (Page 55 Lines 9-10) that the emission of HFCs from foam can have greater impact than the CO2 saved. Although each assessment is application specific, this statement is untrue for virtually all	Accepted.	Danny

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						applications in the field. The authors are directed to the IPCC/TEAP Special Report o HFCs for further information on TEWI aspects (Technical Summary & Chapter 7). (Paul Ashford, Calebgroup)		
6-243	A	55	9	55	11	This statement is incorrect in that it gives the wrong picture of emissions. As mentioned in the previous section, the major emissions from refrigeration are primarily those of CO2 from the operation of the equipment. Would suggest that it is re-written. Suggest "In cases where there is no recovery and destruction of fluoriinated gases at the end-of-life of the foams, greenhouse gas emissions from insulating foam blown with fluorocarbons can exceed the climate benefits of the CO2 avoided due to the use of the insulation. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted, the issue will be checked for consistency in the chapter.	Danny
6-244	A	55	12	55	14	The IPCC Special Report n HFCs gives the take up of non-HFCs blowiing agents as does the report of the European Climate Change Programme 1st phase. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted, agredd, will be referred to.	Danny
6-245	A	55	12	55	12	Presume this should be CFCs as HCFCs were not phased out in 1987 as cited in the reference and are not phased out under the Montreal Protocol until 2040. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted – will be double checked and if right changed.	Danny
6-246	A	55	16	55	24	This paagraph is EU only and must include the regulations from Japan, Canada and Australia. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted. We will include if space permits, or clarify statement that this refers to EU only.	Danny
6-247	A	55	17	55	18	This sentence is very subjective. Many decisions taken on blowing agents are based upon issues such as flammability (ability to handle the fluids), type of foam etc. Regulatory and cost are only part of the decision-making process. (Nick Campbell (Batch 2), ARKEMA SA)	Accepted. Statement will be revisited.	Danny
6-248	A	55	19	55	21	This is only partially correct. It should read, "The EU Regulation on certain Fluorinated gases bans the use of HFCs in one-component-foams and encourages their recovery and recycling." (Nick Campbell (Batch 2), ARKEMA SA)	Accepted.	Danny
6-249	A	55	21	55	24	The author is psychic in his/her knowledge of foam recovery several decades from now. Suggest that sentence is split into two. "….several decades from now. Without effective measures for foam recovery or destruction, this could lead to a total loss to the atmosphere of the remaining blowing agent." (Nick Campbell (Batch 2), ARKEMA SA)	Noted. "several decades from now" will be removed.	Danny
6-250	A	55	22	55	22	Refer the document: Mizuishi, T., S. Murakami and T. Ikaga: Effect of thermal insulation of houses on	Noted, will be considered	Danny

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						greenhouse gas emissions focusing on leakage of fluorocarbons, Proceedings of the 6th International Conference on Eco Balance, Oct 2004, Tsukuba, Japan (Shuichi Miura, Tohoku university of art & design)		
6-251	A	56	12	56	12	include: Aebischer, B., and A. Huser, 2003: Energy efficiency of computer power supplies, Proceedings of the 3rd International Conference on Energy Efficiency in Domestic Appliances and Lighting (EEDAL '03), 1-3 October 2003, Torino/Italy. (Bernard Aebischer, CEPE/ETHZ)	Noted. The inclusion of this reference will be considered.	Person a
6-252	A	57	34	57	34	Banfi, S., Farsi, M., Filippini, M., Jakob, M. (2005). Willingness to Pay for Energy-Saving Measures in Residential Buildings. CEPE Working Paper No. 41, Centre for Energy Policy and Economics (CEPE), Zurich, April (Bernard Aebischer, CEPE/ETHZ)	Noted. The inclusion of this reference will be considered.	Kornelis
6-253	A	58	31	58	31	include: Bertoldi, P., et al., 2002: Standby Power Use: How Big is the Problem? What Policies and Technical Solutions Can Address It?, Proceedings of the ACEEE 2002 Summer Study on Energy Efficiency in Buildings, 18-23 August 2002, Pacific Grove, Cal. (Bernard Aebischer, CEPE/ETHZ)	Accepted. This will be referred to.	Diana
6-254	A	59	42	59	42	include: Calwell, C., and T. Reeder, 2002: Power Supplies: A Hidden Opportunity for Energy Savings. An NRDC Report. San Francisco, CA (Bernard Aebischer, CEPE/ETHZ)	Noted. The inclusion of this reference will be considered.	Diana
6-255	A	60	32	60	32	include: Cremer, C., et al., 2003: Energy Consumption of Information and Communication Technology (ICT) in Germany up to 2010. Fraunhofer Institut Systemtechnik und Innovationsforschung und Centre for Energy Policy and Economics, Karlsruhe and Zurich, January (Bernard Aebischer, CEPE/ETHZ)	Noted. The inclusion of this reference will be considered.	Diana
6-256	A	62	13	62	13	Erb, M., Hubacher, P., Ehrbar, M. 2004: Feldanalyse von Wärmepumpenanlagen FAWA 1996-2003. On behalf of Swiss Federal Office of Energy, Bern (Bernard Aebischer, CEPE/ETHZ)	Rejected – not so relevant.	
6-257	A	62	20	62	24	This short paragraph leaves the impression that little is known regarding how to integrage intensively managed forests into a landscape so as to enhance biological diversity and other landscape environmental attributes.While there is always a need for better information, a great deal is already known. Some illustrative references are (1) Bird, S. et. al., "Impacts of silvicultural practices on soil and litter arthropod diversity in a Texas plantation", Forest Ecology and Management 131 (2000) 65-80. and (2) Wilson, M.D. and Watts, "Breeding bird communities in pine plantations on the coastal plain of North Carolina", The Chat, published by teh Carolina Bird Club, West Columbia SC, Winter 2000 - more references below	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter – we will consider which are the best ones to use.	Danny

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						(Reid Miner, NCASI)		
6-258	A	62	20	62	24	There are a number of additional references examining the benefits of wood-based materials. They include (1) Borjesson, P., and Gustavsson, L. 2000. Greenhouse gas balanced in building construction: Wood versus concrete from life-cycle and forest land-use perspectives. Energy Policy 28(2000):575 588, (2) Scharai-Rad, M., and Welling, J. 2002. Environmental and energy balances of wood products and substitutes. Food and Agriculture Organization of the United Nations (FAO). http://www.fao.org (June 4, 2005). (3) Lippke, B., Wilson, J., Perez-Garcia, J., Bowyer, J., and Meil, J. 2004. CORRIM: Life-cycle environmental performance of renewable building materials. Forest Products Journal 54(6):8 19, More references on this list are shown in the cell below (Reid Miner, NCASI)	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter – we will consider which are the best ones to use.	Danny Formatted: English (U.S.)
6-259	A	62	20	62	24	More references regarding the work being done on life-cycle opportunities to reduce GHGs through selection of low-carbon building products include (4) Peirquet, P., Bowyer, J., and Huelman, P. 1998. Thermal performance and embodied energy of cold climate wall systems. Forest Products Journal 48(6):53–60, (5) Lenzen, M., and Treloar, G. 2002. Rejoinder to: Greenhouse gas balanced in building construction: Wood versus concrete from life-cycle and forest land-use perspectives. Energy Policy 30(2002):249-255, (6) Sarri, A. 2001. Environmental specifications of building parts and buildings (in Finnish). TKK Rakentamistalous [Helsinki University of Technology, Construction Economics and Management]. Published by Rakennustietosaatio RTS [Building Information Foundation RTS], Helsinki. Sponsored by Rakennustieto Oy [Building Information Ltd.]. http://www.rts.fi/Ymparistoselosteet.pdf. (Reid Miner, NCASI)	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter – we will consider which are the best ones to use.	Danny Formatted: English (U.S.)
6-260	A	62	20	62	24	More references explaining the opportunities to address biodiversity through proper forest management (continued from above) include (7) Tucker, J.W., et. al., "Managing mid-rotation pine plantations to enhance Bachman's sparrow habitat", Wildlife Society B u l l e t i n 1998, 26(2):342-348, and (8) Rosenfeld, R.N., "Bredding distribution and nest-site habitat of northern Goshawks in Wisconsin", Journal of Raptor Rresearch Vol 32 (3): 189-194 September 1998,, published by the Raptor Research Foundation, OSNA, Waco TX (Reid Miner, NCASI)	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter – we will consider which are the best ones to use.	Danny Formatted: English (U.S.)
6-261	A	62	20	62	24	More references explaining the opportunities to address biodiversity through proper forest management (continued from above) include (5) Tappe P.A. et. al., "Breeding bird communities on four watersheds under differetn forest management	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter –	Danny Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						scenarios in the Ouachita Mountains of Arkansas", in in Guldin, James M., tech. comp. 2004. Ouachita and Ozark Mountains symposium: ecosystem management research. Gen. Tech. Rep. SRS–74. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 321 p and (6) Carnus, J_M, et. al., "Planted forests and BIodiversity," UNFF Intersessional Experts Meeting on the Role of Planted Forests in Sustainable Forest Management, 24-30 March 2003, New Zealand, available at http://www.maf.govt.nz/mafnet/unff-planted-forestry-meeting/ - More references below (Reid Miner, NCASI)	we will consider which are the best ones to use.	
6-262	A	62	20	62	24	More references explaining the opportunities to address biodiversity through proper forest management (continued from above) include (3) Fox, T.F. et. al., "Amphibian communities under diverse forest management in the Ouachita Mountains, Arkansas", in Guldin, James M., tech. comp. 2004. Ouachita and Ozark Mountains symposium: ecosystem management research. Gen. Tech. Rep. SRS–74. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 321 p.and (4) Shipman, P.A. et. al., "Reptile communities under diverse forest management in teh Ouachita Mountains, Arkansas", in in Guldin, James M., tech. comp. 2004. Ouachita and Ozark Mountains symposium: ecosystem management research. Gen. Tech. Rep. SRS–74. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 321 p - more below (Reid Miner, NCASI)	Noted. Not so relevant for buildign sector; this issue does not need a large number of references in our chapter – we will consider which are the best ones to use.	Danny
6-263	A	66	12	66	12	include: IEA, 2003: Energy Policies of IEA Countries. Switzerland 2003 Review. OECD/IEA, Paris (Bernard Aebischer, CEPE/ETHZ)	Rejected. For each OECD country there are policy reviews s- without a concrete suggestion we are not sure why and where we should include it.	
6-264	A	66	27		28	Provide the citation to the IPCC/TEAP report in full. (James Crawford, Trane/American Standard)	Accepted.	Danny
6-265	A	66	27	66	28	Between these two lines, insert the following: IPCC/TEAP, 2005: Safeguarding the Ozone Layer and the Global Climate System, Issues Related to Hydrofluorocarbons and Perfluorocarbons. (James Crawford, Trane/American Standard)	Accepted.	Danny and
6-266	A	66	39	66	39	Jakob, M., Madlener, R., 2004. Riding down the experience curve for energy-efficient building envelopes: the Swiss case for 1970–2020. International Journal of Energy Technology and Policy 2 (1/2),153–178. (Bernard Aebischer, CEPE/ETHZ)	Noted – inclusion of this reference will be considered.	Sev
6-267	A	66	39	66	39	Jakob et al 2006 b: Jakob, M., Baur, M., Ott, W. 2006 "An Analysis of Direct and	Noted – inclusion of this reference will	Sev

Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person resp
						Indirect Benefits and Costs of Energy-Efficiency Attributes in Residential Buildings" CEPE Working paper No. 47, Zurich, February (Bernard Aebischer, CEPE/ETHZ)	be considered.	Formatted: English (U.S.)
6-268	A	66	39	66	39	Jakob et al 2006 a: Jakob, M., Baumgartner, A., Menti, U., Plüss, I., 2006 "Energy Efficiency, Costs and Comfort in Commercial Buildings – A Comprehensive Cost and Benefit Evaluation". In: Proceedings of IEECB06, Frankfurt (Bernard Aebischer, CEPE/ETHZ)	Noted – inclusion of this reference will be considered.	Sev Formatted: English (U.S.)
6-269	A	69	51	69	51	http://www.enecho.meti.go.jp/english/policy/conservation/budget.html (Shuichi Miura, Tohoku university of art & design)	Noted – will be considered if the report is sent to the TSU.	Hiroshi
6-270	A	71	19	71	19	Ott, W., Seiler, B., Kaufmann, Y., Binz, A. & Moosmann, A.: Neubauen statt Sanieren? On behalf of Swiss Federal Office of Energy, Bern 2002. (Bernard Aebischer, CEPE/ETHZ)	Noted, paper will be checked and probably included, if found.	Danny
6-271	A	73	42	73	42	include SIA, 2006: Elektrische Energie im Hochbau. Empfehlung 380/4 (2005). Schweizerischer Ingenieur- und Architekten-Verein, Zurich (in press, replaces the recommendation published in 1995) (Bernard Aebischer, CEPE/ETHZ)	Reject – too specific.	
6-272	A	77	1	77	1	Figure6.8 is difficult to understand. (Shuichi Miura, Tohoku university of art & design)	Rejected – while the concept is complex, this is a typical formulation of costs and potentials.	
6-273	A	77	1	77	1	The meaning of vertical axis is not clear. Additional explanation is necessary (Takashi Inoue, Tokyo University of Science)	Accepted. Word “marginal” will be included.	Diana
6-274	A	78	0	79		Please add CO2 mitigation potential in Japan. Please see attached file "Table6.1.xls". (Source: Ministry of Economy, Trade and Industry(METI),March 2005,Japan's Energy Outlook for 2030 (Japanese)) (Please see attached file "Japan's Energy Outlook 2030.pdf") (Ryoichi Komiyama, The Institute of Energy Economics, Japan (IEEJ))	Noted. File will be checked if we can use it in any of the present analysis. Otherwise, we have no space to cover potentials of individual countries.	Diana
6-275	A	78	1	80	1	Kyoto Protocol Target Achievement Plan should be added in the Table 6.1. (Takashi Inoue, Tokyo University of Science)	Noted, study will be consulted if we get a copy. However, it can only be included in 6.1 if it is a bottom-up study of potentials.	Diana and S
6-276	A	84	0			Figures 6.1 and 6.2: it might be quite informative to add figures on a per capita basis (e.g. EJ/million of inhabitants, Mt CO2/million of inhabitants) for the various regions. (Radunsky Klaus, Umweltbundesamt)	Noted – these section will be rewritten with figures 6.1 – 6.4 redrawn.	Mark Formatted: English (U.S.)
6-277	A	96	0			The issues involved in Table 9.15 are so complex that they defy the type of simplification attempted here. The table does great disservice to the amount of	Rejected – not relevant for our chapter.	Formatted: English (U.S.)

Chapter-Comment	Batch	From Page	From Line	To Page	To line	Comments	Considerations by the writing team	Person res
						knowledge already gained, and being developed, to improve the carbon and other benefits of the range of mitigation options. For instance, to say that all industrial plantations have a Medium Negative Impact on biodiversity ignores the many examples of where plantations have been integrated into landscapes so as to improve biodiversity. In addition, one can point to situations where forest preservation has resulted in reduced biodiversity. The table does a disservice to the reader by attempting an impossible simplification and should be removed. (Reid Miner, NCASI)		

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [1] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:24:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:27:00 AM**
English (U.S.)

Page 14: [2] Formatted	Diana Urge-Vorsatz	2/18/2006 5:27:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 14: [3] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	Diana Urge-Vorsatz	2/18/2006 5:29:00 AM

English (U.S.)

Page 15: [4] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [4] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [5] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:29:00 AM**

English (U.S.)

Page 15: [6] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:29:00 AM
English (U.S.)

Page 15: [6] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:29:00 AM
English (U.S.)

Page 15: [6] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:29:00 AM
English (U.S.)

Page 15: [6] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:29:00 AM
English (U.S.)

Page 15: [6] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [7] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted | Diana Urge-Vorsatz | 2/18/2006 5:31:00 AM
English (U.S.)

Page 15: [8] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [8] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [9] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [9] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [10] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [10] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [10] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [11] Formatted	Diana Urge-Vorsatz	2/18/2006 5:31:00 AM

English (U.S.)

Page 15: [12] Formatted	Diana Urge-Vorsatz	2/18/2006 5:33:00 AM

English (U.S.)

Page 15: [12] Formatted	Diana Urge-Vorsatz	2/18/2006 5:33:00 AM

English (U.S.)

Page 15: [12] Formatted	Diana Urge-Vorsatz	2/18/2006 5:33:00 AM

English (U.S.)

Page 15: [12] Formatted	Diana Urge-Vorsatz	2/18/2006 5:33:00 AM

English (U.S.)

Page 15: [12] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 15: [12] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 15: [12] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 15: [12] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 15: [12] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [13] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:33:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted **Diana Urge-Vorsatz** **2/18/2006 5:36:00 AM**
English (U.S.)

Page 16: [14] Formatted	Diana Urge-Vorsatz	2/18/2006 5:36:00 AM

English (U.S.)

Page 16: [14] Formatted	Diana Urge-Vorsatz	2/18/2006 5:36:00 AM

English (U.S.)

Page 16: [14] Formatted	Diana Urge-Vorsatz	2/18/2006 5:36:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [15] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	Diana Urge-Vorsatz	2/18/2006 5:40:00 AM

English (U.S.)

Page 16: [16] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [16] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [16] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [16] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [16] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [17] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [17] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:40:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [18] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [19] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [19] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [19] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [19] Formatted	**Diana Urge-Vorsatz**	**2/18/2006 5:41:00 AM**

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 16: [19] Formatted	Diana Urge-Vorsatz	2/18/2006 5:41:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [20] Formatted	Diana Urge-Vorsatz	2/18/2006 5:43:00 AM

English (U.S.)

Page 17: [21] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [21] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [21] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [22] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)

Page 17: [23] Formatted	Diana Urge-Vorsatz	2/18/2006 5:44:00 AM

English (U.S.)