United Nations

FCCC/IDR.6/FIN

Framework Convention on Climate Change

Distr.: General
26 August 2014

English only

Report of the technical review of the sixth national communication of Finland

Parties included in Annex I to the Convention are requested, in accordance with decision 9/CP.16, to submit a sixth national communication to the secretariat by 1 January 2014. In accordance with decision 7/CMP.8, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their sixth national communication supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

This report presents the results of the technical review of the sixth national communication and supplementary information under the Kyoto Protocol of Finland conducted by an expert review team in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" and the "Guidelines for review under Article 8 of the Kyoto Protocol".

GE.14-14906 (E)

1414906

Contents

I. Introduction and summary

A. Introduction

1. For Finland the Convention entered into force on 1 August 1994 and the Kyoto Protocol on 16 February 2005. Under the Convention, Finland made a commitment to contribute to the European Union (EU) quantified economy-wide emission reduction target jointly with all EU member States to reduce the greenhouse gas (GHG) emissions of the EU by 20 per cent by 2020 below the 1990 level.[1]

2. Within the burden-sharing agreement of the European Union for meeting commitments under the Kyoto Protocol, Finland committed itself to keeping its GHG emissions at the base year[2] level during the first commitment period, from 2008 to 2012.

3. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, as amended by decision 1/CMP.8, Finland will as part of the EU take on a quantified economy-wide emission reduction target jointly with all EU member States to reduce its GHG emissions when the amendment enters into force. In accordance with decision 1/CMP.8, the EU and its member States will jointly reduce their GHG emissions by at least 20 per cent in relation to the base year level during the second commitment period.

4. Under the EU climate and energy package, this target will be met by the EU and its member States through a 21 per cent reduction from 2005 in the GHG emissions from installations under the EU Emissions Trading System (EU ETS) and a 10 per cent reduction in the GHG emissions from 2005 in the non-EU ETS sectors (primarily transport, some industrial processes, agriculture and waste). According to the EU effort-sharing of the non-EU ETS target, Finland is to reduce its GHG emissions outside the EU ETS excluding land use, land-use change and forestry (LULUCF) by 16 per cent between 2005 and 2020.

5. This report covers the in-country technical review of the sixth national communication (NC6) of Finland, coordinated by the secretariat, in accordance with the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (decision 23/CP.19) and the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1).

6. The review took place from 7 to 12 April 2014 in Helsinki, Finland, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Constantin Harjeu (Romania), Mr. Eric Kamoga Mugurusi (United Republic of Tanzania), Mr. Vishwa Bandu Pant (India) and Mr. Davor Vesligaj (Croatia). Mr. Pant and Mr. Vesligaj were the lead reviewers. The review was coordinated by Ms. Xuehong Wang (secretariat).

7. During the review, the expert review team (ERT) reviewed each section of the NC6. The ERT also reviewed the supplementary information provided by Finland as a part of the NC6 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with

[1] FCCC/SB/2011/INF.1/Rev.1 and FCCC/AWGLCA/2012/MISC.1.

[2] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Finland in its 2013 annual submission and previous submissions under Article 7, paragraph 1, of the Kyoto Protocol.

8. In accordance with decisions 23/CP.19 and 22/CMP.1, a draft version of this report was communicated to the Government of Finland, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Summary

9. The ERT conducted a technical review of the information reported in the NC6 of Finland in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines on NCs). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[3] is provided in the NC6 (see para. 112 below). The supplementary information on the minimization of adverse impacts referred to in paragraph 7 above is complete and transparent.

10. Finland considered recommendations provided in the report on the in-depth review of the fifth national communication (NC5) of Finland.[4] The ERT commended Finland for its coherent and consistent reporting. During the review, Finland provided further relevant information, namely on national registry, policies and measures, projections and total effect of policies and measures (PaMs) and financial resources and transfer of technology.

1. Completeness and transparency of reporting

11. Gaps and issues related to the reported information identified by the ERT are presented in table 1 below.

2. Timeliness

12. The NC6 was submitted on 30 December 2013, before the deadline of 1 January 2014 mandated by decision 9/CP.16.

3. Adherence to the reporting guidelines

13. The information reported by Finland in its NC6 is mostly in adherence with the UNFCCC reporting guidelines on NCs as per decision 4/CP.5 (see table 1).

[3] Decision 15/CMP.1, annex, chapter II.
[4] FCCC/IDR.5/FIN.

Table 1
Assessment of completeness and transparency issues of reported information in the sixth national communication of Finland[a]

Sections of national communication	*Completeness*	*Transparency*	*Reference to paragraphs*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to paragraphs*
National circumstances	Complete	Transparent		National systems	Complete	Transparent	
Greenhouse gas inventory	Complete	Transparent		National registries	Complete	Transparent	
Policies and measures (PaMs)	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
Projections and total effect of PaMs	Complete	Mostly transparent	78	PaMs in accordance with Article 2	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Financial resources and transfer of technology	Complete	Mostly transparent	88, 91	Information under Article 10	Complete	Transparent	
Research and systematic observation	Complete	Transparent		Financial resources	Complete	Transparent	
Education, training and public awareness	Complete	Transparent		Minimization of adverse impacts in accordance with Article 3, paragraph 14	Complete	Transparent	

[a] A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in the chapter on conclusions and recommendations.

II. Technical review of the reported information in the national communication and supplementary information under the Kyoto Protocol

A. Information on greenhouse gas emissions and national circumstances relevant to greenhouse gas emissions and removals, including other elements related to the Kyoto Protocol

1. Information on relevant national circumstances

14. In its NC6, Finland has provided a concise description of the national circumstances and elaborated on the framework legislation and key policy documents on climate change. Further information on the review of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in chapter II.B below.

15. The descriptions included in the NC6 covers government structure; population profile; geographical profile; climate profile; and the economy, including specific sectors related to energy supply and consumption as well as the energy market, transport, industry, building stock, agriculture, forestry, waste and peatlands.

16. During the review, Finland elaborated on how its national circumstances impact its GHG emissions. Finland's population was 5.4 million at the end of 2011 and is projected to increase to 6.0 million by 2040. The low population density and large geographical area imply long travel distances. Moreover, the cold climate in Finland leads to a high demand for energy use for indoor heating almost all year round. In addition, the import and export of electricity to and from Finland depends to a large extent on the precipitation and hence hydropower production in the Nordic countries, and this has an impact on GHG emissions in Finland. The energy-intensive industry structure and long travel distances have led to relatively high energy intensity and per capita GHG emissions in Finland. The large carbon stock, on the other hand, plays a key role in offsetting the total GHG emissions in Finland.

17. The ERT noted that during the period 1990–2011, the population and gross domestic product (GDP) increased by 8.0 and 49.6 per cent, respectively, while GHG emissions per GDP and GHG emissions per capita decreased by 36.4 and 11.9 per cent, respectively. This indicates that Finland made significant progress in decoupling GHG emissions from economic growth. Table 2 illustrates the national circumstances of Finland by providing some indicators relevant to GHG emissions and removals.

Table 2
Indicators relevant to greenhouse gas emissions and removals for Finland

	1990	*2000*	*2005*	*2010*	*2011*	*Change 1990–2011 (%)*	*Change 2010–2011 (%)*
Population (million)	4.99	5.18	5.25	5.36	5.39	8.0	0.6
GDP (2005 USD billion using PPP)	115.39	141.48	161.10	167.93	172.59	49.6	2.8
TPES (Mtoe)	28.38	32.23	34.26	36.43	34.75	22.4	–4.5
GHG emissions without LULUCF (kt CO_2 eq)	70 451.31	69 345.39	68 763.29	74 551.43	67 033.43	–4.9	–10.1
GHG emissions with LULUCF (kt CO_2 eq)	55 290.29	48 893.85	38 823.74	49 927.73	42 456.00	–23.2	–15.0

	1990	*2000*	*2005*	*2010*	*2011*	*Change 1990–2011 (%)*	*Change 2010–2011 (%)*
GDP per capita (2005 USD thousand using PPP)	23.12	27.31	30.69	31.33	32.02	38.5	2.2
TPES per capita (toe)	5.69	6.22	6.53	6.80	6.45	13.3	–5.0
GHG emissions per capita (t CO_2 eq)	14.12	13.39	13.10	13.91	12.44	–11.9	–10.6
GHG emissions per GDP unit (kg CO_2 eq per 2005 USD using PPP)	0.61	0.49	0.43	0.44	0.39	–36.4	–12.5

Sources: (1) GHG emissions data: Finland's 2013 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

2. Information on the greenhouse gas inventory, emissions and trends

18. Finland has provided a summary of information on GHG emission trends for the period 1990–2011. This information is fully consistent with the 2013 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq) (given in the common reporting format tables), are provided in an annex to the NC6. During the review, the ERT took note of the most recent 2014 GHG inventory data that Finland submitted to the secretariat on 15 April 2014; relevant information is reflected in this report.

19. Total GHG emissions[5] excluding emissions and removals from LULUCF decreased by 4.9 per cent between the base year and 2011, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 23.2 per cent over the same period. Emissions of CO_2 decreased by 0.3 per cent in the period 1990–2011 with significant annual fluctuations mainly as a result of the Nordic electricity market. Emissions of methane (CH_4) and nitrous oxide (N_2O) decreased by 32.9 per cent and 27.8 per cent, respectively, in the same period. Emissions of fluorinated gases (F-gases) increased by 924.3 per cent (9.2 times) from 1990 to 2011. The LULUCF sector has been a net sink in the entire period and constituted removals of 21.5 per cent and 36.7 per cent of total GHG emissions in 1990 and 2011, respectively. An analysis of the drivers of GHG emissions trends in each sector is provided in chapter II.B below. Table 3 provides an overview of GHG emissions by sector from the base year to 2011.

Table 3
Greenhouse gas emissions by sector in Finland, 1990–2011

	GHG emissions (kt CO_2 eq)				*Change (%)*		*Share[a] by sector (%)*	
Sector	*1990*	*2000*	*2010*	*2011*	*1990–2011*	*2010–2011*	*1990*	*2011*
1. Energy	54 494.93	54 464.87	60 550.11	53 384.91	–2.0	–11.8	77.4	79.6

[5] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified.

Sector	GHG emissions (kt CO_2 eq)				Change (%)		Share[a] by sector (%)	
	1990	*2000*	*2010*	*2011*	*1990–2011*	*2010–2011*	*1990*	*2011*
A1. Energy industries	19 187.42	22 119.81	30 490.61	24 628.42	28.4	–19.2	27.2	36.7
A2. Manufacturing industries and construction	13 356.56	11 939.19	9 886.38	9 668.20	–27.6	–2.2	19.0	14.4
A3. Transport	12 756.72	12 842.00	13 430.49	13 228.03	3.7	–1.5	18.1	19.7
A4.–A5. Other	8 963.45	7 380.50	6 564.72	5 701.99	–36.4	–13.1	12.7	8.5
B. Fugitive emissions	230.78	183.37	177.91	158.27	–31.4	–11.0	0.3	0.2
2. Industrial processes	5 130.08	5 582.97	5 772.53	5 585.86	8.9	–3.2	7.3	8.3
3. Solvent and other product use	178.37	124.71	73.58	69.83	–60.9	–5.1	0.3	0.1
4. Agriculture	6 674.33	5 901.67	5 969.70	5 881.11	–11.9	–1.5	9.5	8.8
5. LULUCF	–15 162.01	–20 451.54	–24 623.70	–24 577.44	62.1	–0.2	NA	NA
6. Waste	3 974.60	3 271.16	2 185.52	2 111.73	–46.9	–3.4	5.6	3.2
GHG total with LULUCF	**55 290.29**	**48 893.85**	**49 927.73**	**42 456.00**	**–23.2**	**–15.0**	**NA**	**NA**
GHG total without LULUCF	**70 452.31**	**69 345.39**	**74 551.43**	**67 033.43**	**–4.9**	**–10.1**	**100.0**	**100.0**

Note: The changes in emissions and the share by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA= not applicable.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

3. National system

20. Finland provided in its NC6 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol (decision 19/CMP.1). The description includes all of the elements mandated by decision 15/CMP.1, including the name of and contact information for the national entity; the roles and responsibilities of various agencies and entities; a description of the process for collecting activity data; a description of the quality assurance/quality control plan; and a description of the procedures for the official consideration and approval of the inventory.

21. The ERT took note of the review of the changes to the national system as reflected in the report of the individual review of the GHG inventory of Finland submitted in 2013.

4. National registry

22. In its NC6, Finland has provided information on the national registry in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1. The ERT took note of the review of the changes to the national registry as reflected in the report of the individual review of the GHG inventory of Finland submitted in 2013.

23. During the review, Finland provided a description of its national registry, how it performs its functions and how it complies with the requirements of the technical standards for data exchange between registry systems. The ERT noted that Finland maintains its national registry in a consolidated manner in the Consolidated System of European Union

registries (CSEUR) with all other member States of the European Union. The CSEUR is hosted and facilitated by the European Commission.

5. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol

24. Finland has reported in its NC6 comprehensive and well-organized information on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol. Finland provided a list of contracts concluded with international financial institutions as well as the funds invested under these contracts through multilateral carbon funds for the implementation of joint implementation (JI) and clean development mechanism (CDM) projects under the Kyoto Protocol.

25. The key legislative arrangements related to the implementation of the Kyoto Protocol in Finland include the overarching European Climate Change Programme (ECCP) and national legislative arrangements such as the Act and Decree on the Kyoto Protocol and the Legislation on the Kyoto Protocol Mechanism that transpose provisions of the Kyoto Protocol into Finnish legislation.

26. As a European Union member State, Finland applies European Union common and coordinated PaMs that are relevant to climate change. These include European Union decision 2002/358/EC on the burden-sharing of the European Union's emission reduction target for the Kyoto Protocol, as well as the European Parliament and Council decision 280/2004/EC on the monitoring mechanism, which ensures that European Union progress towards meeting the Kyoto Protocol target is monitored and evaluated.

27. Subsequent to the ECCP, European Union directive 2003/87/EC introduced the European cap and trade system for CO_2 emissions. With the introduction of the EU ETS, a large part of European emissions generated by energy-intensive economic operators was restricted under an EU-wide maximum cap. Emissions outside the EU ETS are subject to national limitation and reduction PaMs in compliance with the European Union effort-sharing decision (ESD) 406/2009/EC.

28. There are other relevant institutional arrangements and procedures for the implementation of the Kyoto Protocol. The Ministry of the Environment bears the administrative responsibility for the climate negotiations. Statistics Finland is the national entity responsible for compiling the Finnish GHG inventory. The Energy Market Authority is the competent authority and the registry administrator for the national emissions trading registry under the Kyoto Protocol and the EU ETS. In addition, according to Finnish legislation, the Ministry of the Environment bears the responsibility for the application of JI and international emissions trading under the Kyoto Protocol, while the Ministry for Foreign Affairs bears the responsibility for Finland's participation in the CDM. The Ministry of Employment and the Economy is responsible for the overall coordination of national energy and climate strategy work, issues related to the Kyoto Protocol mechanisms and transposition and implementation of the EU ETS.

29. Finland ensures public access to information. This right of access to information in official documents is a basic civil right protected by the Finnish constitution and is subject to the provisions of the Act on the Openness of Government Activities.

30. Finland provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and the sustainable use of natural resources. The most important instruments related to forest legislation are the Forest Act and the Act on the Financing of Sustainable Forestry. The PaMs aiming at the conservation of biodiversity and the use of natural resources are included in the Forest

Biodiversity Programme for Southern Finland 2008–2016 (the METSO programme). In the future draft of the new Forest Act, the renewal of forestry after final tree felling is mandatory, and the natural regeneration and sustainable management of forests is encouraged. Another important tool in forest policy is the National Forest Programme, which is implemented and monitored through the cooperation between the public and private sectors.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

31. Finland has provided in its NC6 comprehensive and well-organized information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol.

1. Policies and measures related to implementation of commitments under the Convention

32. Finland reported on its PaMs adopted, implemented and elaborated in achieving its commitments under the Convention and its Kyoto Protocol. Finland provided information on PaMs by sector and by gas and a description of the principal PaMs. Finland has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, in accordance with the objective of the Convention. The NC6 contains a set of PaMs similar to those in the NC5.

33. All PaMs included in the National Energy and Climate Strategy are reported in the NC6. These PaMs were updated in 2013 in order to deliver the 2020 mitigation targets enshrined in the EU climate and energy package and to prepare the pathway towards meeting the long-term European Union mitigation policy. Finland highlighted the policies leading to the increase of emissions resulting from economic development circumstances and reported the PaMs planned to compensate for and avoid these emissions. This includes the development of nuclear energy, which will replace fossil fuel and peat-fired energy generation. Finland also reported the programmes and strategies that were discontinued and those that were updated for the next period leading up to 2020. The textual description and the tabular presentation of results related to PaMs adhere to the UNFCCC reporting guidelines on NCs.

34. However, the NC6 does not include some information in accordance with the guidelines. This includes explicit information on the means for monitoring the quantified effects of the implementation of individual or aggregated PaMs. During the review week, Finland provided more information on the institutional arrangements for monitoring the policy effects. The ERT encourages Finland to report this information in its next national communication (NC). In particular, the ERT encourages Finland to provide detailed information on the monitoring and evaluation systems to quantify the effects of the implementation of individual or a combination of PaMs in each sector.

35. Finland considered the recommendations provided in the review report of the NC5. The ERT commended Finland for its coherent and consistent reporting between the chapters on PaMs and projections. In particular, the ERT commended Finland for its improved information on the measures in the energy sector, the effects of PaMs on different types of GHGs, the implementing entity/entities, major individual measures in the energy sector, and the effects of individual PaMs.

2. Policy framework and cross-sectoral measures

36. The institutional structure in Finland aims to integrate climate change in sectoral development strategies. The Parliament approves the international commitments and decides upon their implementation. The Government has the overall responsibility for the participation of Finland in negotiation processes and the implementation of international commitments, and for the preparation of the National Energy and Climate Change Strategy. A ministerial network, assisted by specific working groups, is responsible for the preparation and updating of the national strategies on energy and climate policy. This ministerial network is comprised of the Ministry of Employment and the Economy, the Ministry of the Environment, the Ministry for Foreign Affairs, the Ministry of Transport and Communications, the Ministry of Agriculture and Forestry, the Ministry of Education and Culture, the Ministry of Finance and the Prime Minister's Office. In the implementation of the energy and climate policy, other stakeholders are also involved, including regional authorities and municipalities. Statistics Finland, being responsible for compiling the national inventory with the support of research institutes, also contributes to the implementation of the energy and climate policy. This institutional structure is supplemented by the Finnish Climate Panel, which acts as the interface between climate science and policymakers, and Climate Arena, which is a broad forum for debating climate issues.

37. The key climate policy targets and measures are incorporated in the National Energy and Climate Strategy, which was updated in 2013 and implements the targets of the EU climate and energy package for 2020. After 2012, Finland has to contribute to the EU emissions reduction commitment included in the EU climate and energy package by transposing the procedures and rules included in the EU ETS (directive 2003/87/EC amended with directive 29/2011/EC) and adopting PaMs to comply with the annual emission allocations established under the ESD (decision 406/2009/EC). Both goals as well as the provisions and activities to achieve these goals are included in the National Energy and Climate Strategy, which provides the basis for the development of Finnish climate policy for 2013–2020. The climate policy after 2020 is outlined in the Government Foresight Report on Long-term Climate and Energy Policy approved in 2009 and in the road map on climate and energy policy until 2050 planned to be finalized in 2014.

38. PaMs included in the National Energy and Climate Strategy are related to the improvement of energy efficiency and enhancement of renewable energy in the economic sectors, the development of the energy market, the improvement of the district heating and cogeneration systems, the development of clean technologies and adaptation to climate change. In addition, the National Energy and Climate Strategy includes objectives related to land-use planning in urban areas and built-up areas. As the development of the urban structure has long-term effects on GHG emissions from transport and buildings, PaMs that aim to minimize GHG emissions related to land use and the urban structure can be replicated across different municipalities.

39. Regions and municipalities assist in the implementation of the Finnish climate policy. The 15 Centres for Economic Development, Transport and Environment, under the coordination of the Ministry of the Environment, Ministry of Transport and Communications, the Ministry of Agriculture and Forestry, and the Ministry of Education and Culture, and in collaboration with the region and regional councils, prepare the regional strategies on climate and energy. Municipalities are involved directly in granting permits and developing initiatives to promote energy efficiency and renewable energy. Municipalities are also carrying out efforts under the Cities for Climate Protection Campaign to establish emission reduction targets, make plans for emission reductions and perform follow-up assessments; these include developing a Carbon Neutral Municipalities Project under the coordination of the Finnish Environment Institute and conducting

activities under the Covenant of Mayors. Table 4 provides a summary of the reported information on the PaMs of Finland.

Table 4
Summary of information on policies and measures reported by Finland

Sectors affected	*List of key policies and measures*	*Estimate of mitigation impact (kt CO_2 eq in 2020)*
Policy framework and cross-sectoral measures	National Energy and Climate Strategy, Government Foresight Report on Long-term Climate and Energy Policy	80–95% reduction in relation to 1990 emissions by 2050
	EU climate and energy package for 2020 and the EU Emissions Trading System	
Energy		
Renewable energy	Promotion of wind power	3 600
	Promotion of biomass (wood chips)	9 861
Energy efficiency	Voluntary energy efficiency agreements	5 583
	Energy Audit Programme	564
Residential and commercial sectors	Implementation of the directive on the energy performance of buildings	2 127
Transport	Promotion of the use of biofuels	2 000
	Renewing the vehicle fleet	2 100
Industrial sectors	Implementation of the European Union regulation on certain fluorinated greenhouse gases (842/2006/EC)	1 000
Agriculture	Increase in the area of multiannual crops on organic soils	557
Forestry	National Forest Programme 2015	NA
	Increasing the area of multiannual crops on organic soils	776.1
Waste management	Implementation of the Finnish Government's decision on packaging and packaging waste (to meet European Union and domestic requirements)	2 300
	Implementation of the new European Union regulation on landfills	200

Note: The greenhouse gas reduction estimates given for some measures are reductions in carbon dioxide or carbon dioxide equivalent for 2020.

Abbreviation: NA = not applicable.

3. Policies and measures in the energy sector

40. Owing to the increase in energy and electricity demand over several decades, the use of primary energy grew from 1990, reaching a peak in 2006–2007. Because of the structural changes in the economy (increase in the contribution of services and less energy-intensive industries) the energy intensity and electricity intensity decreased. In 2011 the energy consumption rates from the final energy consumption were 47 per cent for industry, 24 per cent for space heating, 17 per cent for transport and 12 per cent for other users. The consumption of electricity rates were 48 per cent for industry, 26 per cent for households and 20 per cent for services and the public sector in 2011.

41. In 2011, GHG emissions from the energy sector decreased by 2.0 per cent compared with the 1990 level, mainly owing to the decrease in condensing power generation, the increased electricity imports, and warmer weather, which reduced the need for heating.

However, there was significant variation in GHG emissions from the energy sector during this period. In 2011, GHG emissions generated by the transport sector represent 19.7 per cent (13228.03 kt CO_2 eq) of total GHG emissions. In comparison with 1990, GHG emissions from the transport sector increased by 3.7 per cent (471.31 kt CO_2 eq).

42. ***Energy supply***. Finland is dependent on imported fuels. The energy-intensive basic industries, cold climate and long distances have led to relatively high energy intensity and per capita GHG emissions, which stresses the importance of energy for the country's competitiveness and the well-being of its citizens.

43. The main energy sources until 1960 were wood and the electricity generated by hydro resources. Finland reported that as a result of limited hydro resources, the use of coal and oil increased along with the need to find new energy sources. This need led to the completion of a gas pipeline from Russia and the development of nuclear power units, the first of which was commissioned in 1977, the next three during 1979–1982, and the fifth is under construction. The power system is interconnected with systems in Estonia, Norway, Russia and Sweden. In 2010, the renewable policy was strengthened in order to achieve the EU 2020 renewable target, which is 38 per cent for Finland, to be achieved through the development of wood-based fuels, liquid biofuels, wind power and heat pumps. The install capacity for wind power in Finland increased from 1 MW in 1990 to 288 MW in 2012. As a consequence of the high share of renewables and other GHG emission free energy production, CO_2 emissions per total primary energy supply in Finland are lower than in other European countries despite the use of fossil fuel and peat. Combined heat and power (CHP), which accounts for more than one third of all electricity production in Finland, contributes to savings in primary energy production.

44. ***Renewable energy sources***. Within the framework of the EU climate and energy package, Finland aims to ensure a share of 38 per cent renewable energies in its final energy consumption. The main PaMs to achieve the target involve the increasing use of wood-based fuels, liquid biofuels, wind power and heat pumps. The most recently introduced measure to support renewable energy is the feed-in tariff. The use of supportive PaMs for wind power plants will generate a reduction in GHG emissions of 3600 kt CO_2 eq by 2020, according to the estimates. For forest chip power plants, reduction in GHG emissions is estimated to be around 9861 kt CO_2 eq by 2020 as a result of the supportive PaMs.

45. ***Energy efficiency***. The economy of Finland is relatively energy-intensive. One instrument to reduce GHG emissions through energy efficiency is the EU ETS, which in Finland covers about 52–55 per cent of total GHG emissions. In addition, the Government Decision on Energy Efficiency Measures, which was implemented in 2010, established the policy lines and measures for energy efficiency. The monitoring of the results is conducted through an ex-post evaluation framework. Voluntary energy efficiency agreements signed for 2008–2016 cover industries, municipalities, transport and housing, with a reduction in GHG emissions estimated to be around 6100 kt CO_2 eq in 2015 and 5300 kt CO_2 eq in 2020. An additional 389 kt CO_2 eq are expected in 2015 and 433 kt CO_2 eq are expected in 2020 as a result of the energy efficiency agreement concluded with the oil sector.

46. Another important policy instrument to achieve energy efficiency is the Energy Audit Programme that was launched in 1994, with 40–50 per cent of the subsidy coming from the Ministry of Employment and the Economy. Under this programme, industrial and energy sectors, the commercial and public building sector and municipalities are encouraged to carry out audits on the potential for energy savings and the profitability of savings. This programme is expected to reduce GHG emissions by about 651 kt CO_2 eq in 2015 and about 564 kt CO_2 eq in 2020.

47. ***Residential and commercial sectors***. In Finland, 23 per cent of the total end use of energy is consumed as heating energy in residential, commercial and public buildings. Main heating sources are district heating and electricity, which both are mostly subject to the EU ETS. As an EU member State, Finland transposed the EU directive on the energy performance of buildings, aiming to improve the energy efficiency of buildings and consequently reduce their GHG emissions. The Finnish Government has been supporting energy efficiency improvements through investments and subsidies in low-carbon heating systems, building regulations, regulatory measures to reduce the water needs for heating, an awareness campaign to influence public behaviour, the launch of programmes for renovation and retrofitting of buildings, and the development of research programmes. The expected GHG emission reductions are estimated to be about 3,100 kt CO_2 eq in 2020.

48. ***Transport sector***. The PaMs in this sector aim to deliver the targets included in the climate policy programme for the transport and communications administrative sector 2009–2020 (the Climate Policy Programme for the Transport Sector) and in the ESD. The main PaMs include promoting the use of biofuels, renewing the vehicle fleet, improving energy efficiency and developing more environmentally friendly transport modes. According to the National Act on the Use of Biofuels that came into force in 2011, biofuels will replace 12.5 per cent of the fossil fuels in transport, resulting in GHG emission reductions of 2,000 kt CO_2 eq in 2020. The Climate Policy Programme for the Transport Sector aims at a rate of vehicle fleet renewal of 7 per cent per year in 2020. This is supported by the new car taxation, which is differentiated according to vehicle-specific emissions. The estimated GHG emission reduction from the Climate Policy Programme for the Transport Sector will be 2,100 kt CO_2 eq in 2020.

49. Another measure included in the Climate Policy Programme for the Transport Sector to achieve the planned targets by 2020 is the improvement of energy efficiency in the transport sector. This can be achieved through the energy efficiency agreements in freight and public transport and eco-driving. Finland reported that in 2009 the Public Transport Act was reformed to be in compliance with the European Union public service obligations. The objective of this reform was to create a uniform and user-friendly service package and enhance the number of beneficiaries of public transport. A national strategy and an implementation plan were adopted in 2011 to encourage walking and cycling during 2011–2020. PaMs related to international transport are in compliance with the International Maritime Organization (IMO) and International Civil Aviation Organization (ICAO) policy developments and reported separately in the transport section of the NC6.

50. ***Industrial sector***. Most CO_2 emissions from this sector are reported under the EU ETS, which encourages the sector to reduce its emissions. In addition, Finland reported that energy audits and voluntary energy efficiency agreements are successful measures within the industrial sector.

4. Policies and measures in other sectors

51. Between 1990 and 2011, GHG emissions from industrial processes (including solvent and other product use), agriculture and waste decreased by 14.5 per cent (2,308.9 kt CO_2 eq), mainly owing to emission reductions in the agriculture and waste sectors.

52. ***Industrial processes***. Between 1990 and 2011, GHG emissions from the industrial processes sector increased by 8.9 per cent (455.78 kt CO_2 eq), mainly owing to the increase of F-gas emissions. The key PaMs involved the implementation of JI projects and the EU regulation on certain fluorinated greenhouse gases (directive 842/2006/EC) and the European Commission (EC) directive on emissions from air conditioning systems in motor vehicles and amending Council directive 70/156/EEC (directive 2006/40/EC), with an aim to reduce N_2O emissions and F-gases.

53. ***Agriculture***. Between 1990 and 2011, GHG emissions from the agriculture sector decreased by 11.9 per cent (793.20 kt CO_2 eq), mainly owing to structural changes in agriculture, which have resulted in an increase in farm size and a decrease in the numbers of domestic livestock. The negative natural conditions (short growing season, low temperatures, frosts and low drainage) have been addressed through the implementation of the European Union Common Agricultural Policy (EU CAP) and national measures. Specifically, the implementation of EU CAP with the farming subsidies led to the reduction in GHG emissions from the agricultural sector. About 90 per cent of the farmers participated in an agri-environmental payment programme under the Rural Development Programme for Mainland Finland during 2007–2013.

54. ***LULUCF***. The LULUCF sector in Finland was a net removal of 24,577.44 kt CO_2 eq in 2011. Net GHG emissions and removals from the LULUCF sector increased by 62.1 per cent since 1990, featuring annual variations caused by changes in harvesting levels. The trend was mainly driven by an increase in the carbon sink from tree biomass (37,300 kt CO_2 eq in 2011) and mineral forest soil (6,200 kt CO_2 eq). The main emission sources in the LULUCF sector include organic forest soil, and soils of drained peat lands in forests and croplands.

55. Increasing the forest carbon sink is included in the sustainable forest management objectives in Finland, and is protected by the Forest Act and the Act on Financing of Sustainable Forestry. The prioritization of actions and goals is included in the National Forest Programme 2015, which will be revised in 2014 in order to establish strategic objectives for forest management and development leading up to 2025. Regional forest development plans have also been formulated; these aim to identify the needs and set the objectives for forest management at the regional level. In addition, the METSO programme has been implemented by the Ministry of Agriculture and Forestry and the Ministry of the Environment with the aim of protecting forests and reversing the decline of forest habitats and species.

56. ***Waste management***. Between 1990 and 2011, GHG emissions from the waste sector decreased by 46.9 per cent (1,862.87 kt CO_2 eq), mainly owing to the enforcement of the Waste Act. The implementation of the Waste Act resulted in a reduced volume of waste deposited at landfills through recycling/reuse as well as recovered waste materials and landfill gas being used for energy purposes. Improvement in wastewater treatment has also contributed to emission reductions in the waste sector.

5. Policies and measures related to implementation of commitments under the Kyoto Protocol

57. Finland reported on the policies, action plan and strategies adopted, implemented and elaborated in achieving its commitment under the Kyoto Protocol. Finland reported the financial resources allocated for the implementation of the mechanisms of the Kyoto Protocol. The legislative framework for the participation of Finland in the implementation of the Kyoto Protocol mechanism is the Act on the Use of Kyoto Mechanisms and the Decrees on JI and on the CDM, which entered into force in 2005. Finland reported on the supplementary criteria relating to the Kyoto Protocol mechanisms, indicating that, according to the preliminary estimations, the Kyoto Protocol target could be completely fulfilled through domestic actions.

58. The NC6 includes information on how Finland collaborates with ICAO and IMO to limit emissions from international transport. The Ministry of Transport and Communications is preparing for the fulfilment of the IMO-approved binding energy efficiency target. According to the EU directive 2008/101/EC, aviation will be included in the EU ETS, and reductions in emissions from international air transport in Finland will consequently be attributed to the mitigation efforts of the European Union.

59. In its NC6, Finland reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts, on other Parties, especially developing country Parties. Further information on how Finland strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2013 annual submission, is presented in chapter III.B below.

60. The NC6 underlines Finland's activities to minimize the adverse effects of climate change on developing countries by establishing bilateral cooperation aiming at the integration of mitigation and adaptation in their development policies. To minimize the adverse social impact in developing countries, Finland will focus on CDM projects with the objective of poverty reduction. The cooperation with developing countries aims to facilitate the development, diffusion and transfer of high performance technologies in terms of GHG emission reductions and the diversification of economies to improve energy production.

C. Projections and the total effect of policies and measures, including information on supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

61. The basis of the GHG emission projections presented in the NC6 is the National Energy and Climate Strategy, which was approved by the Government of Finland in March 2013. As a part of the preparation of the strategy, an expert working group of representatives delegated by the ministries responsible for climate policy in Finland prepared the GHG emission projections in 2012. The 2013 National Energy and Climate Strategy is in line with the reduction targets set by the EU legislative climate and energy package adopted by the European Parliament in 2009.

1. Projections overview, methodology and key assumptions

62. The GHG emission projections provided by Finland in the NC6 include a 'with measures' (WM) and a 'with additional measures' (WAM) scenario until 2030, presented relative to actual inventory data during the period 1990–2011. Projections are presented on a sectoral basis, using the same sectoral categories used in the PaMs section and on a gas-by-gas basis for the following GHGs: CO_2, CH_4, N_2O, perfluorocarbons, hydrofluorocarbons (HFCs) and sulphur hexafluoride. Projections are also provided in an aggregated format for each sector as well as for a national total, using global warming potential values from the Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report. Emission projections related to fuel sold to ships and aircraft engaged in international transport were reported separately and not included in the totals.

63. During the review, Finland provided additional information, elaborating on assumptions, drivers, uncertainties and models used for the preparation of projections, the relationship between the energy and LULUCF sectors with regard to the enhanced use of forest biomass for electricity and heat production that has been planned, and the effects of market forces on supply and demand in the energy and LULUCF sectors.

64. The 'with measures' scenario is based on PaMs implemented or adopted by the end of 2012, as presented in chapter 4 of the NC6, while the 'with additional measures' scenario includes planned cost-effective measures and extensions of already implemented and adopted measures primarily aimed at achieving national renewable energy and energy efficiency targets, improving the security of the energy supply and ensuring the diversification of energy sources until 2020.

65. Finland reported on the methodology and models used for sectoral GHG emission projections. The ERT concluded that Finland has applied numerous comprehensive and specialized optimization, simulation and assessment models including: the VATTAGE general equilibrium model for the assessment of the economic effects of PaMs; the TIMES and IMPAKTI models for the energy sector; the EKOREM, POLIREM and REMA models for estimating energy consumption in buildings; the LIPASTO model for the transport sector; the DREMFIA model for the agriculture sector; the MELA and SF-GTM models for the LULUCF sector; the IPCC Waste Model for the waste sector; and an engineering bottom-up model for F-gases. The cooperation between the institutions involved in the modelling process is well-established. The ERT commends Finland for its advanced use of models for the preparation of projections and the assessment of the effects of PaMs. In order to improve the transparency of reporting, the ERT encourages Finland to provide in the next NC information on the relationship and data flow between the different models applied in GHG projections, particularly for the energy sector, in the form of a schematic diagram.

66. Finland used a broad number of assumptions and drivers for the development of scenarios and GHG emission projections in the NC6. These include (list is not exhaustive): GDP growth; expected structural changes in economy which will result in sustained growth in mining, machinery and equipment manufacturing; growth in retail trade and the service sector; population and household growth; changes in the electricity production sector with the promotion of new nuclear and renewable energy sources (biomass and wind); reduction of specific energy consumption for heating and cooling in households and services due to more stringent energy performance of the buildings; increase in annual mileage, fuel economy and promotion of biofuels in road transport; decline of livestock population and fertilizer application in the agriculture sector; and increase of municipal solid waste recycling and incineration. With regard to the development of future energy prices and emission allowance prices, Finland used estimates from the World Energy Outlook of the International Energy Agency published in 2012. The ERT concluded that all relevant variables were included in the preparation of scenarios/projections and that assumptions and expert judgements related to future trends in the periods leading up to 2020 and 2030 are reasonable.

67. Some assumptions have been changed since the NC5 and the previous national climate and energy strategies which provide the basis for emission projections. These include decreased GDP growth due to global economic and financial crises which started in 2008; the structural adjustment of the Finnish forest industry, which is of strategic importance to the Finnish economy; postponement of the start-up of the new nuclear installation Olkiluoto 3; and the development of a more efficient transport sector that includes higher promotion of biofuels. These updated assumptions in the NC6 caused significant reduction of the overall GHG emission trend up to 2020 and 2030 in comparison with the NC5.

68. The sensitivity analysis of the projections included the effects of the changes in the growth rates within energy-intensive industries, including pulp and paper, and iron and steel production, on the overall national energy balance and emissions in Finland. The result of the sensitivity analysis showed that if production in the aforementioned industries increased or decreased by less than 1 percentage point (designated as WM+ and WM- projections in the NC6), and if Finland reduced its net import of electricity to 0 TWh by ensuring the sufficiency of domestic production capacities (which is set as one of the strategic objectives for the energy sector to achieve by 2020), GHG emissions would increase (for the WM+ scenario) or decrease (for the WM- scenario) by 2.8 per cent.

2. Results of projections

69. According to GHG emission trends in the period 2008–2011 and information from the most recent 2014 GHG inventory submission received during the review week, Finland will fulfil its Kyoto Protocol target of limiting its GHG emissions during the first commitment period to its base year level. Preliminary calculations suggest that Finland's total GHG emissions excluding LULUCF in the period 2008–2012 will be approximately 5 per cent below its assigned amount for the first commitment period.

70. Finland's emission reduction target in the second commitment period is part of the overall European Union target of reducing GHG emissions 20 per cent in comparison with the 1990 level by 2020 as set by the EU climate and energy package. Based on the principle of cost-effectiveness, this target was further divided into two specific targets. The first one aims at large emission sources, which are included in EU ETS and second one aims at other emission sources in the energy, transport, industrial processes, agriculture and waste sectors (i.e. the non-EU ETS sectors).

71. The majority of emission reductions will be achieved through the 21 per cent emission reductions occurring in installations covered by EU ETS. In this regard, the Finnish Government has to establish and maintain the monitoring, reporting and verification system, and operators covered by the EU ETS are responsible for emission reductions in accordance with the EU-wide target. At the end of each year, an operator must surrender enough allowances to cover all its emissions. Operators have to monitor and report these emissions in accordance with relevant EU and national regulations.

72. At the EU level, the non-EU ETS sectors (excluding the LULUCF sector) have to reduce emissions by 10 per cent by 2020 in comparison with the 2005 level.[6] Finland's target for the non-EU ETS sector is to reduce emissions by 16 per cent in 2020 in comparison with the 2005 level. The 'with measures' projections scenario presented in the NC6 show that Finland is on track to meet this target as the emissions from the non-EU ETS sector (excluding the LULUCF sector) in 2020 will be around 17 per cent below the 2005 level.

73. According to the 'with measures' scenario, the total GHG emissions in 2020 and 2030 are expected to be 9.3 and 28.7 per cent below the 1990 level, respectively. Correspondingly, emissions of all GHGs except F-gases are expected to decrease or remain at the same level in 2020 and 2030 compared with the 1990 level: CO_2 emissions by 3.8 per cent in 2020 and 27.3 per cent in 2030, CH_4 emissions by 43.1 per cent in 2020 and 47.9 per cent in 2030, and N_2O emissions by 25.3 per cent in 2020; N_2O emissions are expected to remain at the same level until 2030. Total emissions of F-gases will increase in 2020 and 2030 in comparison with 1990 mainly because the production and use of HFCs started in 1995 and continues to increase thereafter. However, compared with the 2011 level, total emissions of F-gases will decrease by 34.9 and 40.6 per cent in 2020 and 2030, respectively. CO_2 will continue to hold the largest share in comparison with other GHGs, with its share estimated to be 84.6 per cent and 81.4 per cent in 2020 and 2030, respectively.

74. In the energy sector excluding transport, the key adopted and implemented measures which affect emission reductions are the start-up of new nuclear power plant units expected in 2015 and in the 2020s (three units in total), the increased use of renewable energy

[6] Based on the effort-sharing principle among the member States, this target was further divided into different national reduction or limitation targets ranging from –20 per cent to +20 per cent of emissions by 2020 compared with the 2005 level, depending on the national GDP per capita compared with the average European Union GDP per capita.

sources (mainly wind and biomass), and the improvement of energy efficiency in buildings. The expected combined effect of these measures is a 6.5 per cent emission reduction in 2020 and a 35.3 per cent reduction in 2030 compared with the 1990 level. In the transport sector, emissions are expected to decrease by 5.5 per cent in 2020 and 17.2 per cent in 2030 compared with the 1990 level, mainly owing to the promotion of biofuels, improvements in energy efficiency and vehicle technology, and a shift to more environmentally-friendly modes of transport. Emissions from industrial processes, mainly CO_2 emissions, are expected to increase by 11.8 per cent in 2020 and 13.7 per cent in 2030 owing to the recovery of iron/steel and cement and lime, as well as hydrogen production. Emissions of F-gases are expected to decline in 2020 and 2030 (see para. 73 above) as a result of the stricter European Union regulations and the implementation of technical measures.

75. For the agriculture sector, emissions are projected to decrease by 11.9 per cent in 2020 and 14.9 per cent in 2030 in comparison with 1990. The main driver is the decline in the livestock population. The LULUCF sector is expected to be a net sink for the entire projected period until 2030, with an estimated removal of 11.9 Gg CO_2 eq despite the expected increased harvesting and utilization of biomass as defined by the National Energy and Climate Strategy. Emissions from the waste sector will decline significantly, by 60.0 per cent in 2020 and 67.5 per cent in 2030 compared with 1990, owing to the reduction of the biodegradable component in landfilled municipal solid waste.

76. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 5 and the figure below.

Table 5
Summary of greenhouse gas emission projections for Finland

	Greenhouse gas emissions (kt CO_2 eq per year)	*Changes in relation to the base year level[a] (%)*	*Changes in relation to the 1990 level (%)*
Kyoto Protocol base year[b]	71 003.51	NA	0.8
Kyoto Protocol target for the first commitment period (2008–2012)	71 003.51	0	0.8
Kyoto Protocol target for the second commitment period (2013–2020)[c]	NA	NA	NA
Quantified economy-wide emission reduction target under the Convention[d]	NA	NA	NA
Inventory data 1990[e]	70 452.31	–0.8	0
Inventory data 2011[e]	67 033.43	–5.6	–5.0
Average annual emissions for 2008–2011[e]	69 468.69	–2.1	–1.4
‘Without measures’ projections for 2020[f]	98 700	39.0	40.0
‘With measures’ projections for 2020[f]	64 400	–9.3	–8.7
‘With additional measures’ projections for 2020[f]	62 200	–12.4	–11.8
‘Without measures’ projections for 2030[f]	61 300	–13.7	–13.1

	Greenhouse gas emissions (kt CO_2 eq per year)	*Changes in relation to the base year level[a] (%)*	*Changes in relation to the 1990 level (%)*
'With measures' projections for 2030[f]	50 600	–28.7	–28.2
'With additional measures' projections for 2030[f]	45 100	–36.5	–36.0

Abbreviation: NA = not applicable.

[a] Base year in this column refers to the base year used for the target under the Kyoto Protocol, while for the target under the Convention, it refers to the base year used for that target.

[b] The Kyoto Protocol base year level of emissions is provided in the initial review report contained in document FCCC/IRR/2007/FIN.

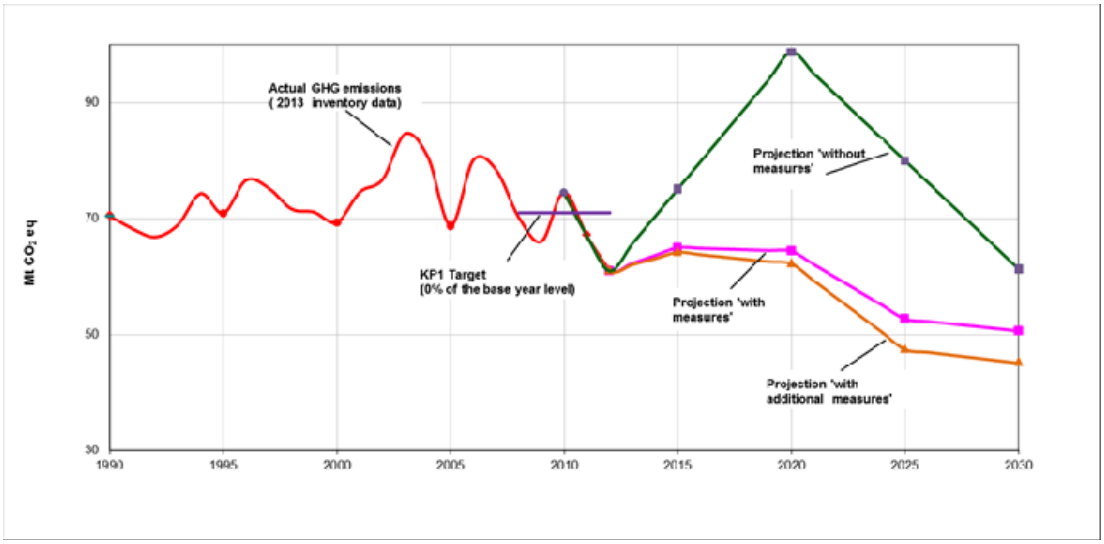
[c] The Kyoto Protocol target for the second commitment period (2013–2020) is a joint target for the European Union and its 28 member States and Iceland. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level. The target for sectors not covered by the European Union Emissions Trading System is 16 per cent for Finland under the European Union effort-sharing decision.

[d] Quantified economy-wide emission reduction target under the Convention is a joint target for the European Union and its 28 member States. The target is to reduce emissions by 20 per cent by 2020 compared with the base year (1990) level.

[e] Finland's 2013 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

[f] Finland's sixth national communication and/or first biennial report. The expert review team estimated the 'without measures' projections based on information provided in the sixth national communication.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2011: Finland's 2013 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry; (2) Data for the years 2011–2020 and 2030: Finland's sixth national communication and/or first biennial report; the emissions are without land use, land-use change and forestry.

Note: The target for the second commitment period of the Kyoto Protocol is based on preliminary estimates of the base year emissions for the first commitment period of the Kyoto Protocol and the quantified emission limitation or reduction objective included in annex 1 to decision 1/CMP.8. The initial assigned amount for the second commitment period will be established after the initial review for the second commitment period of the Kyoto Protocol. The expert review team estimated the 'without measures' projections based on information provided in the sixth national communication.

Abbreviations: GHG = greenhouse gas, KP1 = first commitment period of the Kyoto Protocol

3. Total effect of policies and measures

77. In the NC6, Finland presents the estimated and expected total effect of implemented and adopted PaMs in comparison with the business-as-usual (BAU) scenario from the 2001 Finnish Climate Strategy. Information is presented in terms of total GHG emissions avoided by gas (on a CO_2 eq basis) in 2010 and 2020, with no information provided on the sectoral level. Finland also provided information on the effects of the implemented, adopted and planned individual PaMs presented in chapter 4 of the NC6.

78. During the review week, Finland informed the ERT that the BAU scenario does not fully correspond to the 'without measures' scenario as defined by the reporting guidelines and that values presented in the BAU scenario are outdated. The ERT recommends that Finland improve the transparency of the information on the total effects of PaMs currently presented in Table 5.11 of the NC6, by updating it in its next submission. As was also stated in the NC6, an alternative to estimating the total effects of PaMs is to use the aggregated estimated effect of individual PaMs per sector as presented in the NC6 in tables 4.4 (energy), 4.5 (transport), 4.7 (industrial processes), 4.8 (agriculture), 4.9 (LULUCF) and 4.10 (waste) while trying to limit the overlapping effects of these PaMs to the greatest extent possible in order to reduce overestimation of the total effect of PaMs.

79. Finland reported that the total estimated effect of adopted and implemented PaMs in comparison with the BAU scenario without LULUCF is 31,500 kt CO_2 eq in 2020 (i.e. a top-down approach), and approximately 33,000 kt CO_2 eq when individual PaMs are aggregated for each IPCC sector (i.e. a bottom-up approach). Based on the information reported in chapter 4 of the NC6, the ERT calculated the effect of the PaMs implemented in each sector and the results are presented in table 6 below. The PaMs in the energy sector, which are mostly related to energy efficiency and renewables, will deliver the largest emission reductions, followed by the effect of PaMs implemented in the transport, waste and industrial processes sectors. The most effective PaMs and drivers behind GHG emission reductions are described in chapter II.B above. Table 6 provides an overview of the total effect of PaMs for Finland.

Table 6
Projected effects of planned, implemented and adopted policies and measures in 2020 and 2030

Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*	*Effect of planned measures (kt CO_2 eq)*	*Relative value (% of 1990 emissions)*
	2020				*2030*			
Energy (without transport)	25 318	60.7	NA	NA	5 796	13.9	NA	NA
Transport	4 235	33.2	600	4.7	NA	NA	NA	NA
Industrial processes	1 000	19.5	70	1.4	1 300	25.3	NA	NA
Agriculture	557	8.3	NA	NA	558	8.3	NA	NA
Land-use change and forestry	776	NA	NA	NA	776	NA	NA	NA
Waste management	2 300	57.9	200	5.0	2 600	65.4	380	9.6
Total	**34 187**	**48.5**	**870**	**1.2**	**11 030**	**15.7**	**380**	**0.5**

Source: Finland's sixth national communication.

Note: The total effect of implemented and adopted policies and measures is defined as the difference between the 'without measures' and 'with measures' scenarios.

Abbreviation: NA = not available.

4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

80. In its NC6 and during the review week, Finland provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that Finland could meet its Kyoto Protocol target without the use of Kyoto Protocol mechanisms since the preliminary data for GHG emissions in 2012 shows that total GHG emissions in the first commitment period of the Kyoto Protocol are approximately 5 per cent below Finland's assigned amount.

81. According to information provided in the NC6, Finland acquired 3.6 million certified emission reductions (CERs) and emission reduction units (ERUs) by May 2013 as a result of implemented CDM and JI projects. During the review week, Finland informed the ERT that the total amount of acquired CERs and ERUs amounted to approximately around 6000 kt CO_2 eq by March 2014 and that Finland is planning to carry over these acquired units for compliance in the second commitment period if needed. Finland has transferred approximately 1.0 million ERU units to JI accounts in the registries of other Parties included in Annex I to the Convention, which invested in JI projects in Finland.

D. Provision of financial resources and technology transfer to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol

1. Finance, including "new and additional" resources and resources under Article 11 of the Kyoto Protocol

82. In its NC6, Finland provided information on the provision of support required under the Convention and its Kyoto Protocol. Finland provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines on NCs and under Article 11 of the Kyoto Protocol, as required by the "Guidelines for the preparation of information required under Article 7 of the Kyoto Protocol". Finland indicated the "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention and clarified how it determined such resources as being "new and additional".

83. Following the Copenhagen fast-start finance pledge, Finland used 2009 as the base year for defining "new and additional" financial resources. The Finnish fast-start finance commitment was fulfilled through a net increase of Finnish funding directly allocated to developing countries' climate activities for 2010–2012 (in total EUR 131 million). The baseline figure for overall Finnish climate funding in 2009 was EUR 26.8 million. In 2010, the overall disbursement was approximately EUR 41.7 million, and hence 14.9 million (i.e. the net increase compared with the baseline level) was considered fast-start finance. Similarly, the overall disbursement in 2011 was around EUR 61.5 million, resulting in EUR 34.7 million as fast-start finance. For 2012, the total disbursement was EUR 108.2 million, resulting in EUR 81.4 million as fast-start finance.

84. In addition, Finland considers its additional resources provided to the Global Environment Facility (GEF) as part of the "new and additional" financial resources. Finnish contributions for the current fifth replenishment period (2010–2013) total EUR 57.3 million, which is being used to prevent and mitigate environmental problems in developing countries across the globe.

85. Finland has reported information on the assistance it has provided to developing country Parties that are particularly vulnerable to the adverse effects of climate change to help them to meet the costs of adaptation to those adverse effects. According to its latest Development Policy Programme, Finland focuses its development cooperation on the least developed countries in Africa and Asia. Partner countries' priorities and needs are taken into consideration during the development of these cooperation projects. The assistance addressed the forestry and agricultural sector and the capacity-building provided by the various governments, including their environmental administrations. Finland is one of the major development cooperation donors in the field of meteorology.

86. Furthermore, Finland provided information on its financial resources related to the implementation of the Convention dispersed through bilateral, regional and other multilateral channels, such as the GEF, Least Developed Countries Fund and the Special Climate Change Fund, and the start-up support provided to the Green Climate Fund. Finland has also provided information on its financial contribution to the Adaptation Fund, established in accordance with decision 10/CP.7. Finland contributed EUR 0.1 million to the start-up phase of the Adaptation Fund in 2008. Table 7 summarizes information on financial resources and technology transfer.

Table 7
Summary of information on financial resources and technology transfer for 2009–2012
(Millions of euros)

	Years of disbursement			
Allocation channel of public financial support	2009	2010	2011	2012
Official development assistance (ODA)	927	1 006	1 011	1 027
Climate-related aid in bilateral ODA	12.95	21.97	35.35	33.36
Contributions through multilateral channels, including:				
Contribution to the Global Environment Facility	7.80	15	15	13.65
Fast-start finance	–	14.80	34.70	81.50

2. Technology transfer, including information under Article 10 of the Kyoto Protocol

87. Finland has provided in its NC6 information on activities related to the transfer of technology and notable activities by the public and private sectors. A detailed review of reported information is provided in chapter II.D.3 of the report of the technical review of the first biennial report .

88. However, the ERT noted that Finland did not clearly distinguish between technology transfer activities undertaken by the public sector and those undertaken by the private sector. During the review, Finland elaborated on the difficulty in distinguishing activities undertaken by the public and private sectors. The ERT recommends that Finland continue to explore ways to improve the transparency of reporting on such information in its NC.

89. Finland reported activities related to technology transfer, including success stories. During the reporting period, Finland financed renewable energy projects in Cabo Verde, Honduras, Lao People's Democratic Republic, Sri Lanka and Thailand, and tree planting projects in the United Republic of Tanzania and Uruguay. Finland also promotes business-to-business partnerships in environmentally sound technologies. Finland's development policy and development cooperation efforts promote an inclusive green economy through the establishment of public–private partnerships.

90. Finland also reported its activities for financing access by developing countries to 'hard' environmentally sound technologies such as technology to control GHG emissions and develop adaptation measures, and 'soft' technologies such as capacity-building, the creation of information networks, and training and research activities. Furthermore, Finland has reported on the steps taken to promote, facilitate and finance the transfer of technology.

91. During the review week, Finland provided more information on its support for the development and enhancement of the endogenous capacities and technologies of developing countries. In bilateral cooperation, Finland ensures country ownership through negotiations with partner countries, and thus the priorities of these countries are taken into account. The project documents are agreed upon by the partner countries. The ERT recommends that Finland improve the transparency of reporting by providing more information on the support, development and enhancement of endogenous capacities and technologies of developing countries to improve transparency in the next NC.

E. Vulnerability assessment, climate change impacts and adaptation measures

92. In its NC6 Finland has provided the required information on the expected impacts of climate change in the country and on adaptation strategies and options, including on actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. The NC6 includes an outline of efforts to assess vulnerability. Climate change projections are based on simulations performed using the 28 global climate models used for the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR5). It presents information on vulnerability and adaptation measures in the following sectors: biodiversity; water; agriculture; fisheries and game; forestry; energy; land-use planning and building; industry and commerce; mining; transport and communications; tourism and recreation; insurance; health; and cultural environment. Table 8 summarizes the information on vulnerability and adaptation to climate change presented in the NC6.

Table 8
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Biodiversity and natural ecosystems	*Vulnerability*: shifting of native species; rapid proliferation of southern species that thrive in a warm climate; threat from invasive species *Adaptation*: reduction of human-induced stress on nature by land-use planning; conservation of valuable traditional farmland biotopes; control and prevention of the spread of invasive alien species
Water resources	*Vulnerability*: profound impact on e.g. phytoplankton and zooplankton, benthic fauna, fish stocks and the number of species in lakes and marine waters; severe flooding with high damage costs *Adaptation:* preparedness plans; land-use planning; flood forecast and prevention; changes to regulation permits; saving and recycling of water; improved nutrient management
Baltic Sea and its coastal areas	*Vulnerability*: change in run-off into the Baltic Sea; Bothnian Sea to become ice free by the end of the century; many parts of the Baltic Sea to face sea-level rise by 2100; enhanced erosion and transport of sediments *Adaptation*: adoption and endorsement of the revised European Union Strategy for the Baltic Sea Region and its Action Plan; adaptation strategy and action plan for the Baltic Sea region; implementation of the Flood Risk Management Act (620/2010), the Government Decree on Flood Risk Management and the Helsinki Metropolitan Area Climate Change Adaptation Strategy; the adoption of the River Basin Management

Vulnerable area	*Examples/comments/adaptation measures reported*
	Plans up to 2021
Pristine peatlands	*Vulnerability:* summertime warming to increase evapotranspiration leading to lowered water table levels in peatlands; water table levels in northern peatlands to lower by 15–20 cm (lowered water table levels likely to have a greater impact on peatland ecosystems)
	Adaptation: resolution with guidelines on the sustainable and responsible use and conservation of mires and peatlands
Agriculture	*Vulnerability:* decrease in suitable habitats for various pollinators essential in agricultural production; increased production risks; plant disease epidemics; invasive alien species
	Adaptation: risk profiles and emergency plans for pests and diseases; development of new crop varieties and methods; extension of farm animal grazing period; diversification of crop rotations; warning systems for the occurrence of pest and disease epidemics
Fisheries and game	*Vulnerability:* warming to lead to fish diseases and parasites; leaching of nutrients into waters to increase, thus increasing eutrophication; increase of the risks of invasive alien species and their parasites and/or diseases
	Adaptation: improvement in monitoring; prevention of water pollution; increased buffer zones around small waters; investment in aeration and oxygenation equipment at fish farming facilities; increased purification of discharge water; preparation of management plans for game stocks; regulation of hunting in accordance with game stocks
Forestry	*Vulnerability:* risk of wind damage and forest fires; decline of Northern boreal species of forests, mires and Arctic mountain habitats; increase in the number of spruce bark beetle generations; increased risk of fungal diseases; some damage to berries
	Adaptation: forest management plans; control of pests and diseases; review of forest management practices and regulations in line with changing climatic conditions
Energy	*Vulnerability:* severe storms lead to power outages; energy distribution and transmission less reliable; negative effect on solar energy
	Adaptation: mainstreaming of adaptation to climate change in energy strategies; intelligent electricity network to speed up the repair of storm damage by allowing for automatic fault localization and isolation, thus minimizing the number of customers experiencing long power outages
Tourism and recreation	*Vulnerability:* increased amounts of summer precipitation or extreme weather events to possibly lower the demand for tourism activities/attractions
	Adaptation: integration of adaptation within tourism-related strategies; development of other activities/attractions besides those related to snow for winter tourism; change in the patterns of recreational use of nature
Health	*Vulnerability:* increase in heat-related mortality and morbidity; spread of ticks and tick-borne diseases; increase in slipping injuries and traffic accidents; adverse impact of airborne particulates due to increase in forest fires
	Adaptation: strengthening of healthcare services; dissemination of information on the dangers of the changing climate and the associated increased risks; heatwave and cold-spell warnings
Finnish Lapland	*Vulnerability:* increase in precipitation, which is a threat in particular for the important Christmas tourist season; difficulties for reindeer to dig for lichen, thus increasing their need for supplementary food
	Adaptation: Finland's Strategy for the Arctic Region, released in June 2010 and updated in 2014 for implementation

93. The NC6 observes that gradual changes, such as the increase in average temperatures, will bring potential benefits to some natural resource sectors, such as agriculture, forestry and partly to the outdoor recreation business and tourism. The

combined potential benefits for these sectors could tentatively be in the order of approximately 0.2 per cent of GDP, excluding the growing risks, for example damage from invasive alien species, pests and diseases. Also, the benefits can only be realized if the sectors adapt themselves to the new conditions. The indirect economic costs of extreme weather events may be higher than the direct costs. Owing to the multiplier effect, the economic impacts within a ten-year period may double or increase even more compared with the direct costs. A summary of Finnish research results on impacts and adaptation covering a wide variety of sectors shows that vulnerabilities occur in all sectors.

94. The implementation of indicative measures listed in the adaptation strategy (reported in Finland's NC5) has already started in various administrative sectors. Some of the administrative sectors, including the Ministry of the Environment and the Ministry of Agriculture and Forestry, have published implementation programmes. A significant share of the adaptation measures are implemented at the regional and local level. By the end of 2012, 16 out of 18 regions had published a climate strategy, which included a certain degree of adaptation as well. In 2012, approximately 40 per cent of municipalities were undertaking systematic climate actions, including the promotion of adaptation measures. Tools to help actors consider possible impacts and vulnerabilities have been developed and made available through the website 'Climateguide.fi'. It allows stakeholders to access spatially disaggregated information on climate projections and projected impacts. The Coordination Group for Adaptation to Climate Change was reappointed in 2012 to monitor, promote and assess the implementation of the adaptation strategy, and oversee the revision of the strategy in 2012−2013.

95. In order to support the most vulnerable developing countries in particular, Finland integrated climate change concerns with development cooperation. The Finnish development policy guidelines for the environment, approved in 2009, already noted that climate change mitigation and adaptation should be addressed in all of the most important sectors of Finnish development cooperation. In its latest Development Policy Programme (2012), climate sustainability is one of the cross-cutting objectives of Finland's development policy and development cooperation.

F. Research and systematic observation

96. Finland has provided information on its actions relating to research and systematic observation, and addressed both domestic and international activities, including the World Climate Research Programme, the International Geosphere–Biosphere Programme, the International Human Dimensions Programme, the Global Climate Observing System (GCOS) and the IPCC. The NC6 also reflects actions taken to support related capacity-building in developing countries. Furthermore, Finland has provided a summary of information on GCOS activities.

97. The ERT noted that Finland did not report in its NC6 on the identification of opportunities for and the barriers to free and open international exchange of data and information, and on actions taken to overcome these barriers. During the review, this information was provided to the ERT. The ERT encourages Finland to include such information, including on the actions taken to overcome barriers, in its next NC.

98. In the NC6, Finland highlighted innovations and significant efforts made with regard to climate process and climate system studies, including paleoclimate studies; modelling and prediction, including general circulation models; research on the impacts of climate change; socioeconomic analyses, including analyses of both the impacts of climate change and response options; and research and development on mitigation and adaptation technologies.

99. Since the NC5, more detailed studies of vulnerability in specific sectors and specific environments have been made. These include the following: designating flood-prone areas and flood maps; exploring the indirect economic effects at regional and national level owing to river floods and urban floods caused by extreme downpours; exploring the impacts of high winds, heat spells, drought, snow, frozen ground and winter temperatures on forests; determining the sensitivity of bird populations and certain biotopes to climate change; improving resilience to climate change and variation-induced risks in agriculture; identifying the changes in the exceedance frequency of critical thresholds relating to weather phenomena in transport systems; assessing vulnerability of the elderly people to climate change and regional perspective on the Arctic region.

100. The NC6 also provides summary information on the current status of national plans, programmes and support for ground and space-based climate observing systems, including on the long-term continuity of data, the quality control and availability of data, and the exchange and archiving of data in atmospheric climate observing systems. Finland has built up an archive of systematic atmospheric, oceanic and terrestrial observations based on the regulations of corresponding international organizations. It is participating in World Weather Watch at an operational level through the synoptic network of surface and upper-air stations. These stations also constitute the basis for climatological services, applications and research. The network of stations is complemented nationally by climatological and precipitation stations. Finland is also contributing to the Global Atmosphere Watch.

101. Finland is overseeing the implementation and establishment of the Integrated Carbon Observation System (ICOS) Organization, a European distributed infrastructure for the online, in-situ monitoring of CO_2, CH_4 and N_2O for understanding the present state and future sinks and sources. ICOS links research, education and innovation to promote technological developments and demonstrations related to GHGs.

102. The NC6 provided information on actions taken to support related capacity-building in developing countries. Finland is conducting extensive capacity-building programmes around the world concerning climate observations, research, higher education cooperation relevant to climate change mitigation and adaptation, and the sustainable use of forests. Climate data management systems have been implemented in several developing countries through Finnish development agencies and with considerable financial and personnel support.

103. The ERT noted that research in Finland is diversified and distributed throughout different government bodies and private companies, and that it is of high priority. There are a number of institutes, universities and research organizations that take part in climate change research and systematic observation. In 2011, Finland's research and development expenditure was more than EUR 7 billion, or 3.8 per cent of GDP, higher than the average among the Organisation for Economic Co-operation and Development (OECD) countries. Energy and climate change research is a focal area in public research funding in Finland. Energy research, development and demonstration (RD&D) expenditure steadily increased in recent years, reaching a peak in 2010 with about EUR 270 million in public expenditure, equivalent to 0.16 per cent of GDP, ranking first amongst its OECD peers. However in 2011, RD&D fell marginally to EUR 255 million.

104. The ERT noted Finland's prioritization of research and the relatively high level of funding to support research and development activities at both the national and international levels. The ERT commends Finland for its wide range of systematic observation activities, its prioritization of funding, its enormous global contribution, as well as its related support to developing countries.

G. Education, training and public awareness

105. In the NC6, Finland has provided information on its actions relating to education, training and public awareness, at both the domestic and international level. Information has been provided on the general policy toward education, training and public awareness, primary, secondary and higher education, public information campaigns and training programmes, participation in international activities, involvement of the public and non-governmental organizations (NGOs), as well as public participation in the review of the NC.

106. In Finland, international training activities are carried out by higher education institutions, and capacity-building activities are carried out as part of development cooperation. The number of training activities related to development cooperation has increased in recent years, partly owing to the newly initiated and nationally funded development cooperation programmes, such as the Higher Education Institutions Institutional Cooperation Instrument and the North-South-South Higher Education Institution Network Programme. Both programmes include projects related to climate change.

107. In addition, many higher education institutions and research institutions in Finland provide international training through cooperation with research institutions, higher education institutions and governmental institutions in developing countries to support institutional development. Around 20 per cent of degree programmes in higher education institutions in Finland are international degree programmes. In 2011, the share of international students in polytechnics was 6.2 per cent and in universities 5.2 per cent.

108. Communication on climate change is handled by several ministries and research organizations. The Ministry of the Environment coordinates cooperation on climate communication through a Steering Group for Climate Communications consisting of all relevant ministries as well as research organizations, Association of Finnish Local and Regional Authorities, and Motiva Ltd, and promotes the efficient and sustainable use of energy by providing information, training and expert services.

109. The National Energy Awareness Week is an established annual event where companies, schools and other organizations and households concentrate on promoting energy efficiency. Half of the second grade schoolchildren (children aged eight) in Finnish schools take part in the specific energy awareness week for primary schools. Many companies have incorporated the week into their own environmental programmes and implemented voluntary energy-saving measures. Every year, more than 300 companies and organizations participate in the week. The campaign reaches tens of thousands of Finns. In recent years, the Energy Awareness Week has also been expanded abroad through several global Finnish companies.

110. The largest cities in Finland are also active in promoting awareness among their citizens about climate change and in providing energy and climate change-related advice. More than one third of Finland's municipalities have a climate strategy or are in the process of preparing one. NGOs are well-informed of climate change issues. Recent surveys indicate that up to 85 per cent of Finns take some sort of action on climate change.

111. The ERT concludes that the NC6 has provided information on activities performed by all sections of society to address climate change issues specified under Article 6 of the Convention. The ERT commends Finland for the enormous amount of work done by the Government, civil society, media, universities and communities in informing the Finnish society on climate change issues and mobilizing their involvement.

III. Summary of reviewed supplementary information under the Kyoto Protocol

A. Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

112. Supplementary information provided by Finland under Article 7, paragraph 2, of the Kyoto Protocol in its NC6 is complete and transparent. The supplementary information is located in different sections of the NC6. Table 9 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC6 chapters in which this information is provided. The technical assessment of the information reported under Article 7, paragraph 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 9
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference to the sixth national communication*
National registry	Section 3.4
National system	Section 3.3
Supplementarity relating to the mechanisms pursuant to Articles 6,12 and 17	Section 5.7
Policies and measures in accordance with Article 2	Sections 4,7 and 8
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Sections 3.3, 3.4, 4.1–4.6
Information under Article 10	Sections 3.3, 4.5, 4.7, 6.3, 7.4, 8.2.4, 8.3.4, 8 and 9
Financial resources	Section 7

B. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

113. Finland reported the information requested in section H, "Minimization of adverse impacts in accordance with Article 3, paragraph 14", of the annex to decision 15/CMP.1 as a part of its 2013 annual submission. It also reported how it gives priority to the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol. During the review, Finland provided the ERT with the additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be complete and transparent. The ERT commends Finland for its commitment to assessing the consequences of its response measures, its actions to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention, and its reporting on these actions.

114. The 2013 national inventory report (NIR) and previous NIRs and the additional information provided during the review presented several initiatives by Finland aimed at minimizing adverse impacts. These include environmental impact assessments performed

on national energy and climate strategies; enhancement of sustainable technologies; adoption of a climate sustainability tool for assessing the climate change impacts of its development policy and preventing the adverse impacts of climate change; participation in the development of sustainability criteria for biofuels through scientific studies; promotion of low-carbon development and the capacities of its partner countries to adapt to climate change, including the integration of these goals into partner countries' own development plans; and support for developing countries through capacity-building and the development of their economic infrastructure.

115. Climate change is now mainstreamed in Finland's development programme and aims at supporting programmes and projects that focus on saving energy, increasing energy efficiency, promoting renewable energy production, and focusing on poor countries and regions in particular. According to its development policy, Finland supports the participating developing countries in developing, adopting and scaling up appropriate and affordable renewable-energy and energy-efficiency technologies for improved energy access and local employment, and promotes energy efficiency and overall resource efficiency and research on these matters.

IV. Conclusions and recommendations

116. The ERT conducted a technical review of the information reported in the NC6 of Finland according to the UNFCCC reporting guidelines on NCs. The ERT concludes that the NC6 provides a good overview of the national climate policy of Finland. The information provided in the NC6 includes all elements of the supplementary information under Article 7 of the Kyoto Protocol.

117. Finland's emissions for 2011 were estimated to be 4.9 per cent below its 1990 level excluding LULUCF and 23.2 per cent below including LULUCF. Emission decreases were driven mainly by severe economic recession in the period 2008–2009 and also by the changes in energy supply structure with increased share of renewable energy sources, a decline in the livestock population and nitrogen fertilization, improvements in waste treatment and the implementation of N_2O-abatement technologies in the industrial processes sector. Other factors which impact the trend of GHGs in Finland are net import of electricity from regional electricity market which varies considerably from year to year due to variations in hydropower production in Nordic countries and changes in average annual temperature which are reflected in occurrence of warmer winters in a recent period.

118. In the NC6, Finland presents GHG projections for the period from 2015 to 2030. Two scenarios are included: 'with measures'; and 'with additional measures'. The projected reductions in GHG emissions under the baseline scenario, in relation to the base year, and under the 'with measures' and 'with additional measures' scenarios in 2020, are 9.3 per cent and 12.4 per cent, respectively.

119. Finland contributes to the European Union target of a 20 per cent emissions reduction in 2020 under the Convention and the Kyoto Protocol second commitment period, and therefore does not have a specific national target. The EU ETS sector has a European Union wide emission cap and can purchase emission credits to offset the GHG emissions. Finland's target for the non-EU ETS sector is to reduce emissions by 16 per cent in 2020 in comparison with the 2005 level. Projections presented in the NC6 show that Finland is on track to meet this target.

120. Based on the comparison of the target and the preliminary calculation of the average annual emissions for the first commitment period (2008–2012), Finland is in a position to meet its Kyoto Protocol target for the first commitment period (which is a 0 per cent reduction compared with the 1990 level) with domestic measures only.

121. The NC6 contains information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Finland could meet its Kyoto Protocol target without the use of Kyoto Protocol mechanisms in the first commitment period, but the final accounting and use of units for meeting this target will be decided and implemented during the true-up period.

122. As a European Union member State, Finland has defined its national climate policy by implementing the European Union climate policies and objectives. The National Energy and Climate Strategy for 2013–2020 defines the national contribution to the EU climate and energy package. PaMs included in the National Energy and Climate Strategy are related to the improvement of energy efficiency and enhancement of renewable energy in the economic sectors, the development of the energy market, the improvement of the district heating and cogeneration systems, the development of clean technologies, and adaptation to climate change.

123. The information reported in the NC6 covers all issues on financial resources and technology transfer that are required under the Convention and its Kyoto Protocol. The "new and additional" financial resources provided by Finland include the EUR 131 million provided as fast-start finance during the years 2010–2012 and its contribution of EUR 57.3 million to the GEF during the fifth replenishment period to prevent and mitigate global environmental problems in developing countries. Finland focused its support on renewable energy projects in Cabo Verde, Honduras, Lao People's Democratic Republic, Sri Lanka and Thailand, and afforestation projects in the United Republic of Tanzania and Uruguay. Finland also promotes business-to-business partnerships in environmentally sound technologies among entrepreneurs from Finland and developing countries.

124. Finland puts significant coordinated efforts to assess its vulnerability to climate change and monitor the implementation of the adaptation strategy. Climate change projections are based on simulations performed using the 28 global climate models used for the AR5, and detail vulnerability studies have been performed for a number of specific sectors and issues. With a significant share of the adaptation measures implemented at the regional and local level, Finland is in good progress in coordinating the revision of the climate change strategy adopted in 2005.

125. Climate-related research in Finland is diversified and distributed throughout different government bodies and private companies. The Finish Government pays significant attention to innovations with regard to climate process and climate system studies and supports ground- and space-based climate observing systems. A lot of efforts were devoted by the government, civil society, the media, universities and communities in informing the Finnish society on climate change issues and in mobilizing its involvement.

126. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol provided by Finland in its annual submissions from 2010 to 2013 is transparent. The key initiatives of Finland aiming at minimizing adverse impacts include environmental impact assessments performed on national energy and climate strategies, the adoption of a climate sustainability tool for assessing the climate change impacts of its development policy and preventing the adverse impacts of climate change, participation in the development of sustainability criteria for biofuels through scientific studies, and the promotion of low-carbon development and the capacity of its partner countries to adapt to climate change.

127. In the course of the review, the ERT formulated several recommendations relating to the transparency of Finland's reporting under the Convention and its Kyoto Protocol. The

key recommendations[7] are that Finland improve the transparency of reporting by including in the next NC the following information:

(a) Updated information for the current Table 5.11 of the NC6 on the total effect of PaMs;

(b) Information on how Finland clearly distinguishes between technology transfer activities undertaken by the public sector and those undertaken by the private sector;

(c) More information on the support, development and enhancement of endogenous capacities and technologies in developing countries.

V. Questions of implementation

128. During the review, the ERT assessed the NC6, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No question of implementation was raised by the ERT during the review.

[7] The recommendations are given in full in the relevant sections of this report.

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention". Annex to decision 23/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=20>.

FCCC/SBI/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf01a02.pdf>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Note by the secretariat. Available at <http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>.

FCCC/ARR/2013/FIN. Report of the individual review of the annual submission of Finland submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/FIN>.

FCCC/IRR/2007/FIN. Report of the review of the initial report of Finland, Available at <http://unfccc.int/resource/docs/2007/irr/FIN.pdf>.

FCCC/IDR.5/FIN. Report of the in-depth review of the fifth national communication of Finland. Available at <http://unfccc.int/resource/docs/2010/idr/fin05.pdf>.

Sixth national communication of Finland. Available at <http://unfccc.int/files/national_reports/annex_i_natcom/submitted_natcom/application/pdf/fi_nc6[1].pdf>.

2013 greenhouse gas inventory submission of Finland. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/7383.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Paula Perälä (Ministry of the Environment), including additional material on updated policies and measures, greenhouse gas projections, the national registry and recent climate policy developments in Finland.