

Iceland

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1. SOURCES OF INFORMATION

Iceland's Fourth National Communication and Report on Demonstrable Progress submitted to the UNFCCC, dated March 2006.

Additional information was taken from the UNFCCC Country Profile on Iceland, 2005.

Iceland's Initial Report under the Kyoto Protocol, dated 31 December 2006.

Base-year emissions

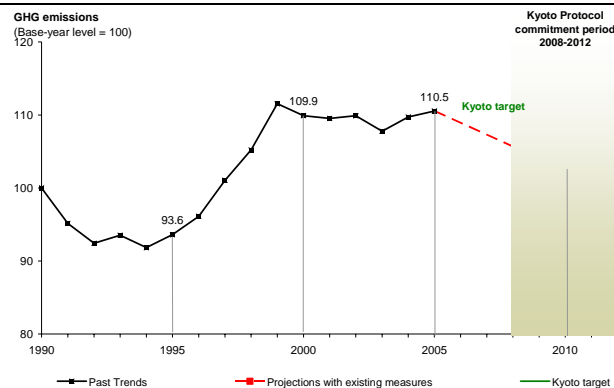
Base-year emissions of greenhouse gases are calculated using 1990 emissions for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) and 1995 emissions for fluorinated gases (SF₆, HFCs and PFCs).

* Base year data is 0.08 MtCO₂-eq lower than data reported in Iceland's Initial Report under the Kyoto Protocol. This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

2. SUMMARY

ICELAND

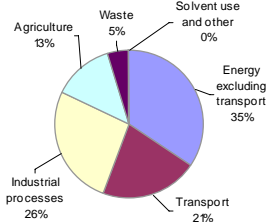
Emissions base year (initial report)	3.4 Mt
Emissions 2005	3.7 Mt
Emissions base year (for projections)	3.3 Mt
Projections 2010 with existing measures	3.4 Mt
No projections with additional measures	n.a.
Kyoto target (absolute)	3.7 Mt
Kyoto target (% from base year)	+ 10 %
Change base year to 2005	+ 10.5 %
Change 2004–05	+ 0.7 %
Change base year to 2010 with existing measures	+ 2.4 %
No projections with additional measures	n.a.
Distance to linear target path 2005	+3.0 index points
Use of Kyoto mechanisms	n.a.
Sinks (Articles 3.3. and 3.4)	n.a.
Emissions in 1990 (Article 3.7)	n.a.



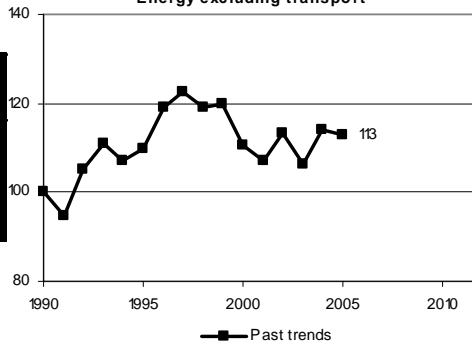
Past emissions: In 2005 Iceland's GHG emissions were 0.7 % above those of 2004 and 10.5 % above base-year levels. Main factors for increasing emissions with regard to the previous year were increasing emissions from transport. Looking at the change 1990–2005, transport and manufacturing industries are the largest contributors to emission increases.

Emission projections: Emissions in 2005 were eight index points above the level projected in the 'with measures' scenario for 2010. Iceland projects to be eight percentage points below the Kyoto target with existing domestic measures.

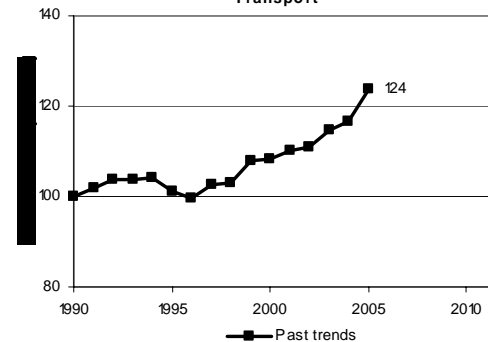
Emissions by sectors (2005)



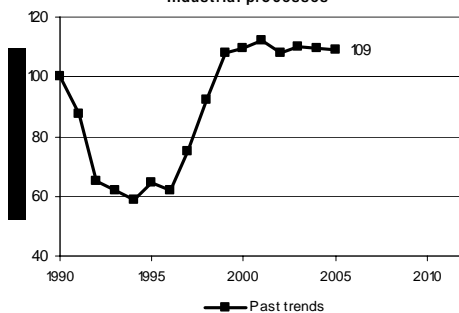
Energy excluding transport



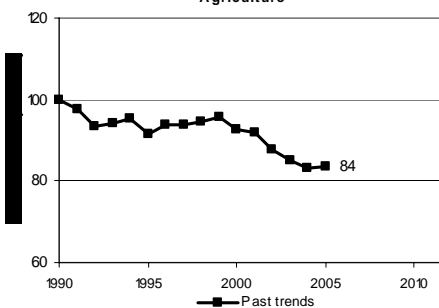
Transport



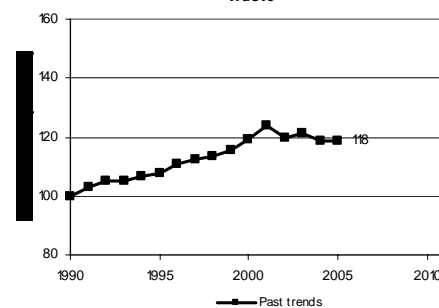
Industrial processes



Agriculture



Waste



3. COMPLETENESS OF REPORTING

Table 1. Information provided on policies and measures

Information provided	Level of information provided	Comments
Policy names	+++	Clear names provided
Objectives of policies	++	
Which greenhouse gases?	++	
Status of Implementation	++	
Implementation body specified	0	Not provided
Quantitative assessment of implementation	+	Limited quantification for 2010
Interaction with other policies and measures discussed	0	Not discussed

Table 2. Information provided on projections

Category of Information	Level of information provided	Comments
Scenarios considered		Scenario 1 and 2. Scenario 2 is considered the 'With measures' scenario here.
Expressed relative to base year	++	Base year/s not stated. Tables/graphs suggest 1990 but do not specify if different for F-gases.
Starting year for projections	?	Not clear
Split of projections	+	No split by gas or sector in the tables or text. Graphs show major industrial/other sources contributing to the total. Only 2010 and 2020 projections are provided.
Presentation of results	+++	Both tables and graphs provided
Description of model (level of detail, approach and assumptions)	+	No description of the model/s used to make projections is provided in the report, but it does discuss modelling assumptions.
Sensitivity analysis (key inputs to model / high, central and low projections scenarios / robustness of model)	++	A sensitivity analysis was carried out with one alternative scenario.
Discussion of uncertainty	0	Not provided
Details of parameters and assumptions	++	Model parameters/assumptions discussed.

4. ASSESSMENT OF POLICIES AND MEASURES

Table 3. Summary of the effect of policies and measures included in the 2010 projections (Mt CO₂-eq.)

Iceland's Demonstrable Progress Report provides the following table that quantifies the effect of selected policies and measures in 2010:

Measure	Annual net reduction of emissions in 2005, compared to business-as-usual	Annual net reduction of emissions in 2008–2012, compared to business-as-usual
Changes in taxation creating incentives to use small diesel cars	0	9 Gg (from 2010)
Lowering of tariffs on no-emission and low-emission vehicles	Not estimated	Not estimated
Consultation process with aluminum smelters to ensure the minimization of PFC emissions from the aluminum industry	65 Gg	161 Gg (Scenario 1) 187 Gg (Scenario 2)
Encouraging the fishing industry to increase energy efficiency	Not estimated	Not estimated
Further reduction of waste disposals, especially in terms of organic waste	Not estimated	Not estimated
Collection of landfill gas for energy recovery	30	30
Increasing carbon sequestration	207 Gg	207 Gg
TOTAL	302 Gg	407 Gg (Scenario 1) 433 Gg (Scenario 2)

Table 4. Detailed information on policies and measures

Table 4 is taken from the UNFCCC country profile and is based on information in the 3rd National Communication. No table of policies and measures was provided in the 4th National Communication/DPR although a range of policies and measures is described.

Major policies and measures	Examples / comments
Framework policies and cross-sectoral measures	
Integrated climate programme	Revised implementation strategy for UNFCCC (2002)
Energy sector	
Energy sector liberalization	Act on deregulation of the electricity market (2003)
Renewable energy sources	Strategy for sustainable development "Welfare for the future" (2002)
Transport	
Vehicle and fuel taxes	Planned change of taxation to favor diesel fuel; planned change in import fees
Public and non-road transport	Measures to improve public transportation and transport logistics
Integrated transport planning	National plan for the development of transport (2002)
Other	Support for research, development and use of hydrogen-fuelled and methane-fuelled vehicles, including the international ECTOS project (2001–2005)
Fisheries^a	
Energy efficiency improvements	Energy efficiency information campaigns, including seminars and workshops on fuel use for fishers; encouragement of the use of best available technologies; use of electricity by ships on shore; measures for switching to electricity at fishmeal factories
Pollution prevention and control	Restrictions on the use of HFC cooling systems
Industry	Voluntary agreement between aluminium industry and the Government on PFC ^b emissions per tonne of aluminium produced
Waste management	Strategy for sustainable development "Welfare for the future"; collection and utilization of methane from the Reykjavik landfill (1997)
Forestry	Four-year programme of revegetation and tree planting (1997–2000); strategic plan for soil conservation and revegetation (2002); five-year plan of action for the forestry sector

5. EVALUATION OF PROJECTIONS

Projections are taken from Iceland's 4th National Communication / Demonstrable Progress Report, which provide two projection scenarios "1" and "2":

- Scenario 1 assumes no additions to energy-intensive industries other than those already in progress in 2004/2005, meaning the enlargement of the Century Aluminium plant in Hvalfjörður and the building of the Alcoa aluminium plant in Reyðarfjörður.
- Scenario 2 is based on the assumption that all energy intensive projects which currently have an operational license will be built, which means four new projects in addition to the two projects already included in scenario 1. This includes an enlargement of the Alcan aluminium plant in Straumsvík, an enlargement of the Iceland Alloys ferrosilicon plant in Hvalfjörður, a further enlargement of the Century Aluminium plant, and the building of Kapla, an anode production plant in Hvalfjörður.

For the purposes of this assessment, scenario 2 is taken as the 'with measures' projection as these projects, although not built yet, have been given an operational licence. The expected effects of the key measures of the climate change policy are integrated into the projections.

The Scenario 2 / 'with measures' projection excludes emissions from projects under 14/CP.7. Under decision 14/CP.7 Iceland can exclude emissions from large projects. In 2003, this accounted for 0.45Mt CO₂ eq., coming exclusively from industrial process emissions. The emissions qualify to be excluded under 14/CP.7 when "the proportional impact of single projects are over 5% of total carbon dioxide emissions of a country in 1990". Projects exceeding this threshold shall be reported separately and carbon dioxide emissions from them not included in national totals to the extent that they would cause the party to exceed its assigned amount.

Table 5. Summary of projections by gas in 2010 (Mt CO₂-eq.)

	Base-year	With measures	With additional measures
Carbon dioxide (excl. LULUCF)	2.08	2.08	NE
Methane	0.41	0.41	NE
Nitrous oxide	0.36	0.36	NE
HFCs	0.00	0.00	NE
PFCs	0.42	0.42	NE
SF ₆	0.01	0.01	NE
Total (excl. LULUCF)	3.28	3.36	NE
% change relative to base year (excl. LULUCF)		2.4%	NA

Table 6. Summary of projections (6 gas basket) by sector in 2010 (Mt CO₂-eq.)

	Base-year	with measures	% change relative to base-year	with additional measures	% change relative to base-year
Energy (total, excluding transport)	NE	NE	NA	NE	NA
Energy supply	NE	NE	NA	NE	NA
Energy – industry, construction	NE	NE	NA	NE	NA
Energy – other (commercial, residential, agriculture)	NE	NE	NA	NE	NA
Transport (energy)	NE	NE	NA	NE	NA
Industrial processes	NE	NE	NA	NE	NA
Waste	NE	NE	NA	NE	NA
Agriculture	NE	NE	NA	NE	NA
Total (excl. LULUCF)	3.28	3.36	2.4%	NE	NA

Table 7. Summary of projections by sector and by gas in 2010 (Mt CO₂-eq.) compared to base-year emissions

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF ₆ , HFCs and PFCs)		
	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures
Energy (excl. transport)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Transport (energy)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Industrial processes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Waste	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Agriculture	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (excl. LULUCF)	2.08	NE	NE	0.41	NE	NE	0.36	NE	NE	0.43	NE	NE

Table 8. Summary of projections (6 gas basket) in 2010, 2015 and 2020 (Mt CO₂-eq.)

	Base year	2010	2010, % of base year level	2015	2015, % of base year level	2020	2020, % of base year level
Total (excluding LULUCF)	3.28	3.360	102.4%	NE	NA	5.335	162.7%

Table 9. Assessment of the target (6 gas basket), with a comparison of 2010 projections in 2005, 2006 and 2007 national reports

	Emissions in MtCO ₂ -equiv., excluding LULUCF			
	2010 projections from 2005	2010 projections from 2006	2010 projections from 2007	2010 projections from 2007 % of base-year level
Base year emissions used for projections	2.84	3.28	3.28 *	100%
Kyoto Commitment/burden sharing	3.12	3.61	3.61	10.0%
With existing P&Ms projections	3.04	3.36	3.36	102.4%
Gap (-ve means overachievement of target)	-0.08	-0.25	-0.25	-7.6%
With additional P&Ms projections	3.04	3.36	3.36	102.4%
Remaining gap	-0.08	-0.25	-0.25	-7.6%
Effect of flexible mechanisms	0	0	0	0.0%
Remaining gap (with use of flexible mechanisms)	-0.08	-0.25	-0.25	-7.6%

Above table excludes LULUCF. LULUCF will be covered in the main report, based on the questionnaire submissions.

Source for 2005 data is 3NC. Source for 2006 and 2007 data is 4NC/DPR.

* Base year data is 0.08 MtCO₂-eq lower than data reported in Iceland's Initial Report under the Kyoto Protocol. This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

6. DESCRIPTION OF MODELLING APPROACH

Overview of modelling approach

No description of the model/s used to make projections is provided in the report, but it does discuss modelling assumptions.

Sensitivity analysis

A sensitivity analysis was carried out, with changes to three assumptions in the transport, industry and waste sectors. Annual emissions in 2010 were found to increase by 0.226 MtCO₂-eq. under this alternative scenario.

Details of the uncertainty assessment

Not reported

7. PROJECTION INDICATOR REPORTING

Not reported

8. REPORTING OF PARAMETERS ON PROJECTIONS

Model assumptions (parameters) are discussed in the report.

Table 10. Indicators for projections to monitor and evaluate progress with policies and measures (2005/166/EC) Annex III

Not reported.

N°	Eurostat Sectors	Indicator	2005	2010	2015	2020	Numerator/denominator	2005	2010	2015	2020
1	Macro	CO ₂ intensity of GDP, t/Euro million					Total CO ₂ emissions, kt GDP, bio Euro (EC95)				
2	Transport C0	CO ₂ emissions from passenger cars, kt Number of kilometres by passenger cars, Mkm									
3	Transport D0	CO ₂ emissions from freight transport (all modes), kt Freight transport (all modes), Mtkm									
4	Industry A1	Energy related CO ₂ intensity of industry, t/Euro million					CO ₂ emissions from fuel consumption industry, kt Gross value-added total industry, Bio Euro (EC 95)				
5	Households A1	Specific CO ₂ emissions of households, t/dwelling					CO ₂ emissions from fossil fuel consumption households, kt Stock of permanently occupied dwellings, 1000				
6	Services A0	CO ₂ intensity of the services sector, t/Euro million					CO ₂ emissions from fossil fuel consumption services, kt gross value-added services, bio Euro (EC95)				
7	Transformation B0	Specific CO ₂ emissions of public and autoproducer power plants, t/TJ					CO ₂ emissions from public and autoproducer thermal power stations, kt all products-output by public and autoproducer thermal power stations, PJ				
8	Agriculture	Specific N ₂ O emissions of fertilizer and manure use, kg/kg					N ₂ O emissions from synthetic fertilizer and manure use, kt use of synthetic fertiliser and manure, kt nitrogen				

9	Agriculture	Specific CH ₄ emissions of cattle production, kg/head					CH ₄ emissions from cattle, kt				
							cattle populations, 1000 head				
10	Waste	Specific CH ₄ emissions from landfills, kt/kt					CH ₄ emissions from landfills, kt				
							Municipal solid waste going to landfills, kt				

Table 11. List of parameters on projections

Not reported.

	2005	2010	2015	2020
Assumptions for general economic parameters				
GDP (value at given years or annual growth rate and base year)				
Population (value at given years or annual growth rate and base year)				
International coal prices at given years in euro per tonne or GJ (Gigajoule)				
International oil prices at given years in euro per barrel or GJ				
International gas prices at given years in euro per m3 or GJ				
Assumptions for the energy sector				
Total gross inland consumption (PJ) (split by oil, gas, coal, renewables, nuclear, other)				
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)				
Energy demand by sector split by fuel (delivered)				
Assumptions on weather parameters, especially heating or cooling degree days				
Assumptions for the industry sector				
<i>For Member States using macroeconomic models:</i>				
The share of the industrial sector in GDP and growth rate				
<i>For Member States using other models:</i>				
The production index for industrial sector				
Assumptions for the transport sector				
<i>For Member States using macroeconomic models:</i>				
The growth of transport relative to GDP				
<i>For Member States using other models:</i>				
The growth of passenger person kilometres				
The growth of freight tonne kilometres				
Assumptions for buildings (in residential and commercial or tertiary sector)				
<i>For Member States using macroeconomic models:</i>				
The level of private consumption (excluding private transport)				
The share of the tertiary sector in GDP and the growth rate				
<i>For Member States using other models:</i>				
The rate of change of floor space for tertiary buildings and dwellings				
The number of dwellings and number of employees in the tertiary sector				
Assumptions in the agriculture sector				
<i>For Member States using macroeconomic models:</i>				
The share of the agriculture sector in GDP and relative growth				
<i>For Member States using other models:</i>				
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)				
The area of crops by crop type				
Emissions factors by type of livestock for enteric fermentation and manure management (t)				
Assumptions in the waste sector				
Waste generation per head of population or tonnes of municipal solid waste				
The organic fractions of municipal solid waste				
Municipal solid waste disposed to landfills, incinerated or composted (in tonnes or %)				

	2005	2010	2015	2020
Assumptions in the forestry sector				
Forest definitions				
Areas of:				
managed forests				
unmanaged forests				

	2005	2010	2015	2020
Assumptions for general economic parameters				
GDP growth rates split by industrial sectors in relation to 2000				
Comparison projected data with official forecasts				
Assumptions for the energy sector				
National coal, oil and gas energy prices per sector (including taxes)				
National electricity prices per sector as above (may be model output)				
Total production of district heating by fuel type				
Assumptions for the industry sector				
Assumptions fluorinated gases:				
Aluminium production and emissions factors				
Magnesium production and emissions factors				
Foam production and emissions factors				
Stock of refrigerant and leakage rates				
<i>For Member States using macroeconomic models:</i>				
Share of GDP for different sectors and growth rates				
Rate of improvement of energy intensity (1990 = 100)				
<i>For Member States using other models:</i>				
Index of production for different sectors				
Rate of improvement or index of energy efficiency				
Assumptions for buildings (in residential and commercial / tertiary sector)				
<i>For Member States using macroeconomic models:</i>				
Share of tertiary and household sectors in GDP				
Rate of improvement of energy intensity				
<i>For Member States using other models:</i>				
Number of households				
Number of new buildings				
Rate of improvement of energy efficiency (1990 = 100)				
Assumptions for the transport sector				
<i>For Member States using econometric models:</i>				
Growth of transport relative to GDP split by passenger and freight				
Improvements in energy efficiency split by vehicle type				
Improvements in energy efficiency split by vehicle type, whole fleet/new cars				
Rate of change of modal split (passenger and freight)				
Growth of passenger road kilometres				
Growth of passenger rail kilometres				
Growth of passenger aviation kilometres				
Growth of freight tonne kilometres on road				
Growth of freight tonne kilometres by rail				
Growth of freight tonne kilometres by navigation				

	2005	2010	2015	2020
Assumptions for the agriculture sector				
<i>For Member States using econometric models:</i>				
Agricultural trade (import/export)				
Domestic consumption (e.g. milk/beef consumption)				
<i>For Member States using other models:</i>				
Development of area of crops, grassland, arable, set-aside, conversion to forests etc				
Macroeconomic assumptions behind projections of agricultural activity				
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)				
Development of farming types (e.g. intensive conventional, organic farming)				
Distribution of housing/grazing systems and housing/grazing period				
Parameters of fertiliser regime:				
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)				
Volatilisation rate of ammonia, following spreading of manure on the soil				
Efficiency of manure use				
Parameters of manure management system:				
Distribution of storage facilities (e.g. with or without cover):				
Nitrogen excretion rate of manures				
Methods of application of manure				
Extent of introduction of control measures (storage systems, manure application), use of best available techniques				
Parameters related to nitrous oxide emissions from agricultural soils				
Amount of manure treatment				

9. COUNTRY CONCLUSIONS

The 'with measures' projection shows that with currently implemented policies and measures, Iceland's emissions will rise relative to the base year by 2.4%, by 2010. This represents an increase of around 0.1MtCO₂-eq compared to 1990 levels. Emissions reported under Decision 14/CP.7 are projected to be 1.59 Mt CO₂ eq. for the same period. Thus, Iceland is set to achieve its dual Kyoto commitments, namely the Kyoto target of +10% of 1990 levels and the 1.6 Mt CO₂ eq. permitted for reporting under Decision 14/CP.7. In summary, Iceland's projections show it will over achieve its Kyoto target by 0.25 MtCO₂ eq.

In terms of completeness of reporting, policies and measures were well described but with limited quantification. The reporting of projections would benefit from a split by gas and sector, and the full time series of base year, 2005, 2010, 2015 and 2020.