Study

# Resource Efficiency Gains and Green Growth Perspectives in Hungary

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- Hungary is more vulnerable to climate change than most countries in Europe in a number of areas: declining biodiversity, air pollution, and decline in the quantity of annual precipitation. Although Hungary is responsible for a mere 0.2–0.5 per cent of global greenhouse gas emissions, its per capita emissions are still significantly higher than the global average (main contributors: energy sector 75 per cent, agriculture 13 per cent). However, Hungarians tend to fear the effects of climate change less than the EU average.

- Various political strategies for fighting climate change can be observed: e.g. EU-regulated emission-trading system and the National Climate Change Strategy (NÉS), including plans for reducing the consumption of fossil fuels, curbing the current level of energy consumption, launching a civic initiative for energy efficiency, increasing the share of renewable energy sources and developing public transport.

- There is a great need to stimulate a »green economy« and reshape the economic structure, in order to change domestic production in accordance with climate protection considerations. This would also yield specific economic benefits: reducing per unit energy consumption would improve productivity, enhance the security of energy supplies and decrease Hungary's dependence on energy imports. Practically all political forces in Hungary endorse developing the green economy.

# Content

# 1. Global and Domestic Impact of Climate Change

## 1.1 Environmental Change

The average surface temperature of the earth was long estimated at around 15°C. According to the 2007 report by the Intergovernmental Panel on Climate Change (Change, IPCC),[1] however, average air temperature rose by 0.74 ± 0.18°C between 1905 and 2005. The IPCC argues that global climate is changing primarily as a result of greenhouse gases emitted by humans. According to the IPCC's estimate, earth's average temperature may rise by as much as 6.4 degrees Celsius, which would wreak unforeseeable changes.

### Rising Temperatures and Changes in the Distribution of Precipitation

The most important change is the significant rise in mainland temperature and the somewhat more moderate growth in ocean temperatures. The 1990s was the warmest decade of the past millennium. An autumn 2011 study states unequivocally that the earth is warming up. Researchers at UC Berkeley have examined over a billion temperature data from fifteen points across the globe and have shown that mainland temperatures have risen by roughly 1 degree Celsius since the mid-1950s.[2] The projections show that we can expect local temperature swings across the entire globe. We also need to reckon with warmer summers in many parts of Europe and North and South America. There are already fewer observed days of frost.

Significant changes in the distribution of precipitation are also likely to occur, and this will result in prolonged periods of drought, as well as rains causing dry periods and intense floods. The frequency of summer droughts has already manifestly increased, primarily in Asia and Africa. The changes in the distribution of precipitation could result in the desertification of certain regions, and may also significantly decrease groundwater levels in numerous areas. Higher temperatures lead to greater evaporation in the oceans, but at the same time the increased vapours will lead to more precipitation. The water cycle is becoming more intense, and in substantial portions of the northern hemisphere precipitation levels have grown by 5–10 per cent. Inconstant weather causes a greater frequency of intense downpours, as well as snow and windstorms.

### Melting Ice Sheets

With an area now of only 10.87 million square kilometres, the Arctic ice cap has broken a negative record.[3] Warming at the Arctic exceeds the global average. Between 2000 and 2007, average global temperature was 0.54 Celsius higher than in the reference period of 1951–1980. In the Arctic region, however, warming exceeded 2 degrees in the same period. In 2008, the difference in the levels of warming reached 3.5 degrees Celsius.[4] Rising temperatures and substantial melting of maritime ice and frozen lands has led to a release of greenhouse gases (carbon dioxide and methane) contained in the frozen soil, a process that reinforces climate change. All the above has led to rising sea levels and concomitant disasters. In addition to traditional greenhouse emissions, soot emissions deriving predominantly from the burning of biomass and diesel engines also contribute to melting the North Pole.

Glaciers are shrinking significantly worldwide, since not enough ice emerges during the winter to counterbalance the amount that melts during the warmer periods. Glaciers in Norway and Alaska are rapidly declining, while the substantial decline in the glaciers in the Andes and the Himalayas is threatening the water supply of the respective regions' inhabitants.[5] The ice of the Himalayas is the potable water source for some 40 per cent of the world's population. Although the shrinking of European glaciers began as early as the seventeenth century, this process has accelerated in recent decades: some glaciers have lost 90 per cent of their mass. The southern parts of the Siberian ice sheet have also begun to melt. This ice sheet harbours a significant amount of methane,

1. See: http://www.ipcc.ch/

2. See: http://www.agromonitor.hu/index.php/mezo/35-mezo/4980-globalis-felmelegedes-fueggetlen-kutatok-is-megersitettek-az-eghajlati-valtozasokat

3. Rekordsebességgel olvad az északi-sarki jég [The Arctic ice is melting at a record pace]; 12 July 2010, http://index.hu/tudomany/kornyezet/2010/07/12/rekordsebesseggel_olvad_az_eszaki-sarki_jeg/

4. Korom nélkül az éghajlatért [Soot-free for the sake of the climate], Levegő Munkacsoport, 2010. http://levego.hu/kiadvanyok/korom_nelkul_az_eghajlatert

5. See: http://hu.wikipedia.org/wiki/Glob%C3%A1lis_felmeleged%C3 %A9s

perhaps up to 10 per cent of their total mass. Methane warms the climate with 21 times greater intensity than carbon dioxide. Calculations suggest that, roughly, a 5°C warming would lead to the total melting of the Siberian ice sheet.

### Rising Sea Levels and Changes in Oceanic Currents

The melting of the ice sheets and the heat expansion of oceans may result in rising sea levels. A substantial and increasing proportion of humanity lives along the seacoast, and hence a sea level rise of 40 cm[6] may endanger as many as 100 million people. Between 1961 and 2003, 1.8 mm of annual increase was measured, but between 1993 and 2003 the average annual value rose to 3.1mm.[7] Rising temperatures intensify the evaporation of seawater, which in turn leads to a decrease in water levels. Increased evaporation also means more precipitation, a substantial part of which lands in Antarctica in the shape of snow, however, reducing the decline in water level resulting from evaporation. Although calculations differ, it is certain that water levels are rising in the Atlantic and Pacific Ocean regions, while the Indian Ocean is experiencing a fall in water level. If more substantial warming occurs, however, then the melting of ice in Greenland would result in a dramatic rise in sea levels,[8] potentially amounting to several meters, which would threaten hundreds of millions of people. An even more significant warming and a melting Antarctica would at the same time result in the sea level rising by several tens of meters.

The melting ice brings freshwater into the Atlantic Ocean and, as a consequence, the Gulf Stream, a phenomenon connected to levels of salt concentration, may change its course, decelerate or even cease entirely. In the absence of the Gulf Stream, winter temperatures in Northeast Europe may drop by as much as 10°C. Similar streams in the Pacific may also be adversely affected by climate change.

The El Niño phenomenon may also be connected to climate change: a warm water current is created in the Pacific Ocean and this neutralises the cold currents coming from Antarctica. This phenomenon leads to intense storms and floods in the Pacific coastal region of the United States, while also generating droughts on the side part of the Pacific Ocean, in Asia.

## 1.2 Ecological Damage

The environmental impact of temperature change affects the fate of the terrestrial species. Habitats disappear and species that cannot adapt to changing living conditions lose ground, while other species proliferate. So-called »ecosystem services« decline – there has, for instance, already been a drop in pollination – and floods and ground erosion proceed unchecked. The changing environment also has a significant impact on agricultural productivity. We may sum up the ecological effects of climate change as follows.[9]

We speak of physiological effects with reference to changing external conditions, such as the case in which rising temperatures, increasing $CO_2$ concentration or changes in water supply impact the life processes of plants and animals. Warmer temperatures and higher $CO_2$ concentrations spur plant development and nutritional intake, indeed, they even improve the water management of plants. Considerably more decisive is water access, however. There are only a few areas on our planet where this is not the most crucial factor. As far as Hungary is concerned, the most susceptible species are those whose furthest sphere of expansion happens to be here. Physiological changes are already apparent in domestic woodlands (beech and common oak). Changes and shifts in seasonal temperatures are influencing the life cycle of certain species (phenological effects). The life stages of insects are fundamentally affected by climate, and hence, through insects, climate change impacts the entire food chain and the evolution of pollination. The geographical expansion of species is also altered on account of climate change. The relations between individual species are transformed and the operation and services of ecosystems become modified.

6. See: http://index.hu/tudomany/friz3206/

7. See: http://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html#1-1

8. See: http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/428.htm

9. Bálint Czúcz: Az éghajlatváltozás hazai természetközeli élőhelyekre gyakorolt hatásainak modellezése [Modelling the impact of climate change on domestic semi-natural habitats], Doctoral (PhD) dissertation, Budapest, 2010.
http://phd.lib.uni-corvinus.hu/523/1/czucz_balint.pdf

The ability of individual species to adapt to changing circumstances – or their failure to do so – is referred to as evolutionary adaptation. One positive effect may be that currently tundra-covered regions may come to host forests instead.

### Declining Biodiversity

The decline in the variety of species and in biological diversity – in other words, biodiversity – is one of the crucial challenges of our age. Currently, considerably more species become extinct as a result of human activities then can emerge as a result of natural variation.[10] In addition to the narrowing of biological living spheres and intensive agricultural production, climate change is among the main causes of this process. Climate change is to a substantial degree responsible for the loss of biological niches. Already the 2002 report[11] of the Intergovernmental Panel on Climate Change (IPCC) stated that climate change causes the loss of natural habitats and a decline in biodiversity. Biodiversity in Europe will decline by 20–30 per cent[12] in the case of a 1.5–2.5°C rise in average temperatures. As many as 800 plants and 40 per cent of birds and butterflies are considered critically endangered. According to another study[13] there is an 18–35 per cent chance that 1,103 animal and plant species will become extinct by 2050 on account of climate change. The German Biodiversity and Climate Research Centre and the Senckenberg Gesellschaft für Naturforschung (Association for Research on Nature) projects that the genetic diversity of individual species may drop by 84 per cent as a result of climate change.[14] Several European species may become limited to Alpine and Scandinavian regions.

### Acidification and Warming of Oceans

Oceans are vast $CO_2$ absorbents, absorbing one-third of all anthropogenic emissions, some 9 billions tonnes annually. The $CO_2$ dissolved in the oceans makes the latter acidic, which makes it difficult for shellfish to extricate carbonates. As a result of the melting polar ice, individual populations of seals[15] and polar bears become endangered or perish. On account of warming, corals expunge the algae that coexist symbiotically with them, which leads to the destruction of the former. Some estimates suggest that one-third of all corals worldwide have perished as a result of this process.

## 1.3 Health Damage

### Air Pollution and Climate Change

Greenhouse gas emissions in our region occur jointly with the emission of traditional air pollutants, the main sources of which are transportation, heating and industry. As already mentioned, air pollution is responsible for the premature death of roughly 16,000 Hungarians each year.[16] Also, 15–30 per cent childhood asthma is related to the proximity of roads with heavy traffic.[17] Calculations suggest that measures seeking to reduce greenhouse gas emissions also substantially reduce air pollution and the health-related damage associated with it. Were the EU to increase its climate protection emission reduction targets from 20 per cent to 30 per cent by 2020, then in Hungary alone this could result in savings ranging from 370 million to 1.081 billion euros, claims a 2010 report published by the civic organisations Health and Environment Alliance (HEAL) and Health Care Without Harm Europe (HCWH Europe).[18] As for the entire EU, the estimated annual savings could be as high as 30.5 billion euros, on top of the 52 billion euros that would

10. Gyorsabban pusztítja az emberiség a fajokat, mint amilyen gyorsan az evolúció működni tud [Humanity destroys species more rapidly than the speed at which evolution can operate], 2010. 03. 31. Available at: http://www.origo.hu/idojaras/20100331-gyorsabban-pusztitja-az-emberiseg-a-fajokat-mint-amilyen-gyorsan-az.html

11. See: www.ipcc.ch/pdf/technical-papers/climate-changes-biodiversity-en.pdf

12. See: http://klima.kvvm.hu/index.php?id=12

13. See: http://www.geog.umd.edu/resac/outgoing/GEOG442%20Fall%202005/Lecture%20materials/extinctions%20and%20climate%20change.pdf

14. See: http://www.origo.hu/idojaras/20110829-genetikai-valtozatossag-fajpusztulas-kiirtja-a-meg-ki-sem-fejlodott-fajokat.html

15. See: http://www.climate.org/topics/ecosystems/seals-battle-climatechange.html

16. Acid News, June 2010: http://www.airclim.org/acidnews/2010/AN2-10.php#1

17. Summary report of the Aphekom project 2008–2011, http://www.endseurope.com/docs/110302b.pdf

18. Szigorúbb éghajlatvédelemmel javulna a magyar lakosság egészsége és pénzt is megtakarítanánk [Stricter climate protection would improve the health of the Hungarian population and help us save money, too]; 5 December 2010. http://levego.hu/hirek/2010/12/szigorubb_eghajlatvedelemmel_javulna_a_magyar_lakossag_egeszsege_es_penzt_is_megtakari. The full report and background summary available in English here: www.env-health.org/r/93

already result from a 20 per cent reduction of emissions. The savings would result predominantly from improved air quality.

### New Diseases Appearing

The changing, warming climate also has an adverse impact on the geographical expansion of various creatures that spread a variety of contagious diseases. Several species spreading epidemics – for example, mosquitoes and ticks – and hence the associated diseases (malaria, Dengue fever, encephalitis) have also spread to cooler mountainous regions, in northern and southern directions. The fact that malaria has spread to the eastern African mountain region can already be ascribed to climate change. More precipitation helps the spread of mosquitoes. For the time being, the consequence of climate change in Hungary could be the expansion of the prevalence of ticks, which spread Lyme disease and meningitis. In the long run, however, even the risk of malaria might grow.

### Energy Poverty

Climate change might bring higher energy prices, which would ultimately burden the general population. Energy poverty on account of high energy prices already causes 5,000 additional deaths per winter,[19] predominantly because of insufficient heating. By raising energy prices, climate change could exacerbate this situation, although it might also alleviate it through warmer winters and reduced heating costs.

## 1.4 Economic Risks

### Agriculture

Although the agricultural sector is one of the most significant emitters of greenhouse gases – responsible for 12–20 per cent of all emissions – warming and the changing distribution of precipitation will result in declining agricultural production. Increasing $CO_2$ concentrations and minor warming will increase yields in agriculture in regions with moderate and cooler climates, as long as there is sufficient precipitation. In the hotter climates – that is, in the Asian, African, Latin-American regions that were poorer to begin with – agricultural productivity will probably fall, however.[20] But if warming exceeds 3 degrees it would lead to falling yields even in moderate climates. In a study that examined the period between 1980 and 2002, every half a centigrade of warming in the average temperature leads to a 3–5 per cent decrease in agricultural yields.[21]

### GDP Decline

Most scientists agree that climate change will bring economic losses. The most prominent calculation stems from the so-called Stern Report. In response to a request by the British prime minister, Sir Nicholas Stern, a former senior expert at the World Bank, produced a report in 2006 on the expected economic impact of climate change. According to the British economist we would have to spend 1–1.5 per cent of today's global GDP to reduce greenhouse gas emissions in order to prevent a 10–15 per cent GDP decline later. The scientist argues that in the worst case GDP might drop even by 20 per cent on account of climate change.

## 1.5 Societal Damage: Migration, Growing Poverty and Security Policy

The slogan of the 2009 conference on the Framework Convention on Climate Change in Copenhagen was Climate Justice.[22] The dearth of water, declining agricultural production and the further spread of epidemics resulting from climate change will occur predominantly in the poorer developing countries (see earlier sections). Climate change is anticipated to most affect numerous regions of West Africa, Southeast Asia and Central America, as well as Bangladesh and Afghanistan. Growing poverty, the decline in the availability of resources and natural disasters related to climate change will lead to conflicts and mass migration. In 2009 alone 20 million people become homeless on account of environmental

19. Tirado Herrero, S. and Ürge-Vorsatz, D. 2010. Fuel poverty in Hungary. A first assessment. Centre for Climate Change and Sustainable Energy Policy (3CSEP), Central European University, Budapest.

20. See: http://en.wikipedia.org/wiki/IPCC_Fourth_Assessment_Report

21. See: http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/emission/076.htm

22. See: http://www.fenntarthato.pte.hu/wp-content/uploads/2011/06/hmp.pdf

disasters.[23] By 2040 at least 25 million people will lose their homes on account of climate change, although worst-case scenarios project as many as a billion becoming homeless.

The British research institute International Alert has designated water distribution as the main source of conflicts in the near future. Lacking access to water on account of melting glaciers and changes in the distribution of precipitation threatens billions of people in numerous parts of the world. Even today, 1.1 billion people have no clean potable water at their disposal.[24] Hundreds of millions of people may be forced to leave their place of residence and move to towns or foreign countries because of declining agricultural production, lack of water, droughts and potential floods. Some experts already discern a connection between several ongoing conflicts, such as the civil wars in Sudan and the Congo, and environmental issues. EU decision-makers had already recognised that the struggle against the harmful effects of climate change would be conducted most effectively in the affected countries. The Tampere Process also emphasises that partnership ties must be strengthened with those countries from which numerous immigrants come.

Agricultural yields could drop substantially in many areas of Hungary as a result of declining groundwater levels, extreme distribution of precipitation and the desertification of some areas of the Hungarian Alföld (lowland region). This process could lead to growing poverty in rural populations and increasing migration to towns, as well as rising food prices and unemployment. Thus food price inflation, unemployment, rising poverty, hunger and potentially shortfalls of potable water could lead to social tensions in Hungary.[25]

## 1.6 Anticipated Effects of Climate Change in Hungary

Although there are studies suggesting that in many respects Hungary is the country in Europe most threatened by climate change,[26] and that the average temperature in Hungary is rising almost one and a half times faster than the European average,[27] Hungarians nevertheless tend to fear the effects of climate change less than the EU average. In response to a 2011 survey by Eurobarometer,[28] 14 per cent of Hungarians responded that climate change is the greatest threat endangering our planet. The EU average was 20 per cent. The two endpoints in terms of concern about climate change were the Luxembourgians and the Portuguese: 34 per cent of respondents in the former and a mere 7 per cent in the latter consider climate change the greatest threat. When several options may be provided, then 48 per cent of Hungarians mention climate change as a potential source of danger, which ranks us somewhere near the middle in the EU (the EU mean was 51 per cent).

According to the VAHAVA report (for a detailed discussion of VAHAVA see Section 3.2) and the associated scientific studies, climate change will not spare Hungary. Indisputable changes are manifest in domestic temperature and precipitation trends: climate will be become warmer, especially in summer, while precipitation will decrease in summer and increase in winter, with groundwater levels declining and the frequency of floods increasing. A summary[29] provided by the government ministry responsible for environmental affairs notes that in Hungary climate change will affect natural ecosystems, natural habitats, forests, agriculture, water management and human health as well. The highest daytime temperature has risen significantly, by 2–3 degrees Celsius between 1975 and 2004.

The National Meteorological Service (OMSZ) has observed[30] that the highest temperatures of the cold season have tended to become warmer since 1990, thus rendering the snowy period shorter. Thawing arrives more quickly and earlier. Climate change is therefore palpable in Hungary, too. Within the framework of the EU's PRUDENCE programme calculations were conducted with regard to Hungary, seeking to project what temperatures and precipitation distribution we need to

23. See: http://www.origo.hu/idojaras/20091209-menekultek-eghajlatvaltozas-klimakockazat.html

24. See: http://www.matud.iif.hu/2011/02/03.htm

25. See: http://www.haborumuveszete.hu/rovatok/hirek/a_hadseregek_is_megszenvedik_a_klimavaltozast/?print

26. See: http://index.hu/tudomany/globmo0914

27. See: http://matrix.zug.hu/hir/magyarorszag-es-a-klimavaltozas_6.php

28. See: http://ec.europa.eu/public_opinion/archives/ebs/ebs_372_en.pdf

29. See: http://klima.kvvm.hu/index.php?id=12

30. Éghajlati tendenciák és időjárási szélsőségek a Kárpát-medencében [Climatic trends and meteorological extremes in the Carpathian Basin] Laszló Bozó, Sándor Szalai, Zita Bihari, Országos Meteorológiai Szolgálat [National Meterological Service] http://www.vahavahalozat.hu/files/Kecskemet/Plen%C3%A1ris%20el%C5%91ad%C3%A1sok/1_Boz%C3%B3.pdf

anticipate in the period 2071–2100. If greenhouse gas emissions reach the highest anticipated levels, then in the entire period temperature could experience a significant 3–5 degree increase compared to 1961–1990. Summers might become 4–5°C hotter. Even a temperature increase of 1.5–2.5°C would decrease biodiversity in Europe by 20–30 per cent.

There is also increasing evidence of a decline in the quantity of annual precipitation. Six of the 20 driest years with the lowest levels of precipitation fell in the post-1990 period. Researchers have observed that the frequency of very dry years has become twice as high as the ratio we would be experiencing under an unchanged climate. Rapid downpours that cause floods might also become frequent occurrences. According to the IPCC report, it is conceivable that in the coming decades domestic rivers could lose as much as half of their water output during summer seasons. A decline in ground water levels is already observable. For instance, in valleys and low-lying areas, such as the Alföld, a decline in groundwater levels will occur with increasing frequency. OMSZ writes that »the trends are such as to indicate a deterioration in the balance of surface water. This compels timely preparation for climate change especially in states that are sensitive and vulnerable to the systemic deterioration of the surface water balance.« The EU's PRUDENCE model suggests that the distribution of precipitation will be significantly altered. There will be fewer instances of rainfall with more precipitation in each instance. The total quantity of precipitation will decline significantly during the summer and somewhat less during the autumn, while it will grow substantially in the winter and slightly in the spring. Even a 30–35 per cent change is conceivable between seasons.

The ministry's homepage also claims that the number of deaths resulting from warmer weather and heat waves that occur in connection with climate change will rise. Various already present pathogens, or creatures carrying such pathogens, could proliferate, and new ones might appear as well. Experts suggest that the present proliferation of ticks carrying dangerous infectious diseases is also probably connected to warming.

Studies suggest that aquatic habitats in Hungary are especially endangered by climate change.[31] The anticipated, more substantial warming may wreak incalculable changes. It is safe to declare that the quality of domestic waters and their wildlife will be damaged by climate change. The changing distribution of precipitation within individual years – hotter periods with less precipitation during the summer – could cause physical and chemical changes in aquatic habitats. Periodically recurring water shortages could altogether ruin habitats or cause their wholesale disappearance. Another increasing risk will stem from the fact that domestic lakes, which tend to be shallow, will be more susceptible to climate change than deeper lakes. Since Lake Balaton is considered a very shallow lake, it may react especially sensitively to climate change. Even the near past featured instances of extremely low water levels; in fact, levels have been observed to drop by as much as 70 cm. Especially endangered is the exceedingly rich wildlife of seasonal waters and marshes. Evaporation increases the dissolved salt content of water, thereby contributing to salinisation. As the water becomes warmer, invading species will have an easier time, which in turn endangers domestic fish species since they cannot migrate – unless they adapt, they will die out. Warming will therefore reduce biodiversity in our waters. Several studies caution that the region between the Danube and Tisza rivers will increasingly become desertified. Precipitation is decreasing in the Homokhátság region, for example, but when rain does fall, the amount of precipitation is abruptly considerable. Thus flood and drought periods oscillate, which reinforces the desertification of the sand steppes of the Alföld region.[32]

## 1.7 Climate-sceptic Arguments

Both decision-makers and scientists often try to refute climate change or its anticipated effects with scientific arguments. We have collected a few controversial issues below. Brett Parris of Monash University in Australia has compiled scientifically substantiated responses[33] to rebut the arguments of climate-sceptics, and we will use his answers to address the issues raised below.

Probably the most prominent argument invoked against action aimed at alleviating global warming is that climate change is a natural phenomenon that has often

31. Klímaváltozás és a hazai vizes élőhelyek [Climate change and domestic aquatic habitats], Csaba Sipkay, http://klimabarat.hu/node/99

32. See: http://nol.hu/lap/hetvege/20111015-a_magyar_sivatag

33. See: http://tinyurl.com/BPClimateFAQs

occurred in the history of our planet. Reference to previous climate changes is fallacious and misleading, argues Brett Parris, because earth's human population has never been as high as it is now, especially not along the seashores that will be submerged under water in the future. In the course of previous climate changes temperatures shifted by a few centigrade over a period of millennia. The 4–7 °C degree warming following the Ice Age, for instance, took 5,000 years, while the IPCC considers it conceivable that we will experience the same change within a mere century. We do not know of any example in the past 50 million years when the average surface temperature increased by 5°C, and hence we also do not know whether earth's wildlife is capable of adapting to such a change.

Although the climate has previously changed on account of processes independent of man, it does not follow that current climate change is also a natural process. The Intergovernmental Panel on Climate Change (IPCC) observed a few years ago[34] that we can state with at least 90 per cent probability that current climate changed is caused by greenhouse gases emitted by humans. Scientists are capable of estimating with reasonable accuracy which processes impact climate and to what degree, and on the basis of these estimates they have pronounced that the cause of the present climate change is evidently the fact that concentrations of $CO_2$ and other greenhouse gases have increased by over 30 per cent since the Industrial Revolution. Even though there have indeed been earlier climate changes, this insight has absolutely no bearing on our understanding of the current situation.

It has been noted in several forums that in reality earth's climate has been cooling since 1998. This is a misunderstanding, since although 1998 was a peak year, this does not alter the basic, decades-old trend of warming. Many believe that cosmic rays cause global warming, but this notion has not been substantiated by scientific data.[35] A frequent argument is that the strength of solar radiation and changes in sunspot activity underlie warming. Scientific investigations of these phenomena reveal, however, that these changes are not substantial enough to influence our climate, and that no significant temperature change as a result of sunspot activity has been observable in recent times.[36] The IPCC does note that solar radiation increased in the first half of the twentieth century, but it also points out that the impact of the latter is decisively smaller than the temperature increase experienced.

The argument is often voiced that we should wait for more evidence showing that changes are taking place before implementing major measures to combat them. This argument fails on the grounds that we have already undergone a 1.5 degree warming since the onset of industrialisation and, at the same time, the longer we delay these measures the greater the damage will be and the more difficult and costly it will be to reverse the processes in question.

## 2. Emission Reduction Possibilities in Hungary

The basis of the struggle against climate change is the reduction of the emission of greenhouse gases. The most important greenhouses gases are the following: carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide ($N_2O$), sulphur hexafluoride (SF6), halogenated hydrocarbons (CFC-s) and ozone. Rough estimates suggest[37] that, compared to the period prior to the Industrial Revolution, carbon dioxide concentration in the earth's atmosphere has increased by 25 per cent, methane by over 100 per cent and nitrous oxide by 8 per cent. Although we emit carbon dioxide in the greatest quantity – 94 per cent of greenhouse gases – the impact on climate of the gases emitted in smaller quantities (methane 4 per cent, nitrous oxide 2 per cent) is often much stronger, potentially even several thousand times more potent than that of carbon dioxide.

Estimates suggest[38] that the energy sector contributes 75 per cent of total greenhouse gas emissions in Hungary, while agriculture contributes 13 per cent, non-energy producing industrial processes add 7 per cent, and the waste sector another 5 per cent.

34. See: http://www.fenntarthatofejloves.net/2007/02/04/a-klimavaltozas-emberi-eredetu-ipcc-jelentes/

35. See: http://www-personal.buseco.monash.edu.au/~BParris/BPClimateChangeQ&As.html#_Toc240972839

36. See: http://hu.wikipedia.org/w/index.php?title=F%C3%A1jl:Sunspot-co2.jpg&filetimestamp=20070617101225

37. See: http://www.env-in-cent.hu/infoklima/tudomany2.html

38. J. Feiler and D. Ürge-Vorsatz (2010) Hosszú távú (2050) kibocsátás csökkentési célok Magyarország vonatkozásában [Long-term (2050) emissions reduction targets in the Hungarian context], available at: http://www.nfft.hu/dynamic/Hosszu_tavu_kibocsatas_csokkentesi_celok_Magyarorszag_vonatkozasaban.pdf

## 2.1 Carbon Dioxide: Reduction and green investments

In Hungary, carbon dioxide ($CO_2$) is emitted primarily through energy consumption, industry, waste incineration and shifts in land use. Pursuant to the plans laid down in the National Climate Change Strategy (NÉS),[39] domestic energy use may be reduced by as much as 70 per cent by 2050, while heat use for producing hot water and for use in industrial processes could decline to as little as 5 per cent of the current level. The NÉS claims that 40 per cent of all housing could be passive housing without carbon dioxide emissions, and modernisations in the remaining housing units could reduce energy use by 75 per cent. Energy use in transportation could also be significantly reduced through technological modernisation, rationalisation of transportation and by giving preference to public transport.

Industrial $CO_2$ emissions may be lowered by a sustainable consumption that requires fewer products, the reuse and recycling of products and the development of technologies that demand less energy and fewer resources for production. Next to the energy industry, the largest emitter is the cement industry.

Energy use – and thus $CO_2$ use as well – in agriculture is expected to decline significantly, since green energy sources are considerably easier to access than hitherto, and the machinery, too, will soon shift to renewable energy sources. Deforestation and changes in land use and forestry are the greatest sources of greenhouse emissions in the tropics. In Hungary, land use, changes in land use and the forestry sector are greenhouse absorbents. Domestically, forests are the main carbon dioxide absorbents, and even domestic arable lands absorb more greenhouse gases on average than they emit. Unfortunately, a rise in the frequency of forest fires is also likely in Hungary, which would constitute considerable additional emissions. Changes in land use increase emissions in some instances, while they reduce it in others. $CO_2$ produced during waste incineration may be disposed of by using carbon capture and storage (CCS), compressing it underground. Energy efficiency can be improved if a portion of the heat produced by the city wastewater system is recaptured by a heat-exchanger.

39. See: http://klima.kvvm.hu/documents/14/NES_6.4c.pdf

In addition to relevant EU provisions, several economic incentives also reinforce the spread of renewable energies. Pursuant to Resolution 40/2008 (IV. 17.) of the Hungarian Parliament on energy policy between 2008 and 2010, the proportion of renewable energy must be raised to 136–186 PJ. Biomass may move to the fore among renewable energy sources, although its current use is subject to considerable criticism for its lack of sustainability.[40] According to the author of the autumn 2011 volume This Is the Way Forward! Vision 2040 Hungary 1.1 (Erre van előre! Vision 2040 Hungary 1.1),[41] biomass, biogas and coal energy will gain in importance among the renewable energy sources, and in the short term they also anticipate a growing role of energy plantations. The Vision 2040 projection also suggests that by increasing energy efficiency and embracing energy conservation, Hungary could rely exclusively on renewable energy by 2040. In 2008, the Ministry of the Economy compiled the Hungarian National Energy Efficiency Action Plan (Magyarország Nemzeti Energiahatékonysági Cselekvési Tervét) for the period 2008–2016. The plan envisions annual savings of 5.38 PJ by implementing the following measures: renewing residential and institutional building stocks, energy-saving new buildings, energy transformation and »greening« of transportation and shipping and of energy-consuming groups of products.

## 2.2 Methane and Nitrous Oxide

Methane ($CH_4$) is a strong greenhouse gas, 23 times as potent as carbon dioxide. In 2007, 60 per cent of methane in the atmosphere was attributable to human activities, primarily agriculture.[42] The following sectors are responsible for methane emissions: rice production (28 per cent); animal husbandry (22 per cent); biomass heating (20 per cent); energy industry (18 per cent); and landfills (12 per cent). Significant emissions are also contributed by peat-bogs on account of deforestation in Southeast Asia. Furthermore, the thawing of frozen peat marshes in Siberia could release as much as 70,000 million tonnes of methane into the atmosphere. The digestion of ruminating animals is also a significant source of high methane emissions, and the use of fertilisers brings methane into the air, too. Methane emissions in Hungary dropped

40. See: www.mtvsz.hu/dynamic/biomassza-dilemma2.pdf

41. See: http://www.legszennyezes.hu/errevan.pdf

42. See: http://www.blathy.hu/tananyag/klimavaltozas.pdf

between 1985 and 1995, in parallel with the significant decline in the number of cattle, and have remained stable at that lower level ever since.

The dominant part of total greenhouse gas emissions stemming from solid waste landfills consists of methane emissions, supplemented by methane emissions from wastewater management and $CO_2$ emissions from waste incineration. Recently, the proportion of the latter has grown. There are plans for the near future to collect and reuse all the methane from landfills and wastewater in energy production. Environment and Energy Operational Programme tenders subsidising the recultivation of old landfills have led to reductions in methane emissions in Hungary.

In addition to being the main source of methane emissions, agriculture is also the main contributor of nitrous oxide ($N_2O$) emissions, responsible for 77 per cent of all emissions. Nitrous oxide ($N_2O$) is a potent greenhouse gas, 296 times as strong as carbon dioxide. $N_2O$ emissions result from the use of artificial and traditional fertilisers. The use of artificial fertilisers, however, leads to fewer emissions.

## 2.3 F Gases (Sulphur Hexafluoride, Halogenated Hydrocarbons)

Among the F-gases it is the so-called CFCs, HCFCs and HFCs, together with halogenated hydrocarbons, that constitute a particular problem. They decompose very slowly and hence their emission warms the climate for centuries. These gases have been used since the 1930s as they are easy to compress, for example in refrigerators and later in spray cans. Because of their harmful effect on the ozone shield, the compounds also known as freons (CFCs and certain HCFCs) were banned within the framework of the Montreal Protocol.

In addition to freons, we also use a lot of halogenated hydrocarbons, which harm the ozone layer less, but harm the climate more. The electronic industry uses roughly 8,000 tonnes of sulphur hexafluoride ($SF_6$) annually as inert gases. $SF_6$ also takes centuries to decompose. Viewed from a trajectory of 500 years, an $SF_6$ molecule causes 32,000 times more harm to the climate than a $CO_2$ molecule.

## 2.4 Soot, Ozone and Climate

Materials that only linger a short while in the atmosphere also contribute to global climate change. Examples of the latter are soot particles, which are created in the process of the imperfect burning of fuels and biomass. German environmental and consumer protection organisations initiated their campaign Soot Free for the Climate[43] in March 2009. The Hungarian Clean Air Group (Levegő Munkacsoport) joined this group in spring 2010.[44] Soot particles accelerate warming both because their black surface absorbs the radiation of the sun and warms their immediate environment and also because by amassing in the Arctic ice or in glaciers they reduce the light-reflecting capability (albedo) of snow or ice surfaces by 40 per cent,[45] thereby accelerating the melting of ice. Soot ends up in the Arctic polar region transported by the prevailing winds primarily from Europe, and to a lesser extent from North America and Asia. Several EU laws prescribe reductions in soot emissions. Pursuant to EURO standards PM10 (10 particles under 10 micro-metres), emissions by vehicles will have to be curbed continuously, industrial emissions are regulated, and indeed, since November 2010 even the burning of fallen leaves has been banned in Budapest. There are strict limits on the acceptable levels of particles – that is, PM10 – that may be in the atmospheric air, primarily because of the potential health damage they cause. In many Hungarian towns PM10 pollution exceeds the daily limits set by the European Union (decree 4/2011. VM), specifically the rule which only allows for 35 days per annum and per measuring station when PM10 concentrations may exceed the limit. As a result, the European Commission initiated proceedings against Hungary and other countries in 2009.[46]

On 6 October 2011 the Hungarian Cabinet adopted the cross-sectoral action plan for reducing PM10. The budget bill allocates HUF 80 million to this end. The domestic civic organisation involved in this issue, the

43. See: www.russfrei-fuers-klima.de

44. See:www.koromkampany.org

45. Dennis Clare (2009), »A Quick Look at Black Carbon«, The presentation is available at: http://www.igsd.org/climate/documents/blackcarbon.pdf

46. A Bizottság a levegőminőséggel kapcsolatos uniós jogszabályok betartására szólítja fel Franciaországot és Magyarországot [The Commission calls on France and Hungary to abide by EU legislation on air quality]; 28 December 2010. http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1420&format=HTML&aged=1&language=HU&guiLanguage=en

Working Group for Air, welcomed the plan and offered its support.[47] The Group's statement said that the plan »contains almost all those measures that this civic organisation has called for in the past years. Nevertheless, we have some concerns that the implementation of the programme – as has often happened in similar cases in the past – will be endlessly drawn out.«

In the lower air strata, ozone is created out of nitrous oxide, carbon monoxide and organic fumes. Exhaust emissions emanating from vehicles also create ozone and other reactive compounds. This is the state that we refer to as smog in cities. Ozone concentrations regularly exceed limit values in Hungary. Ozone concentrations in the air can be lowered by reducing road traffic and by using low-emission vehicles and pre-empting the emission of industrial solvents.

## 3. Adaptation to Climate Change

### 3.1 EU and Other International Strategies

Since our climate and correspondingly our natural environment, too, will inevitably change according to the IPCC report, beyond reducing emissions we will also have to adapt to altered circumstances. Many international and domestic research groups have explored the possibilities for adapting to global climate change. Man learned a long time ago how to adapt to climatic change, but nevertheless, in the course of human history such environmental changes were generally speaking not long-term and permanent transformations, and generally it was not multiple factors at once that changed adversely. Climate change, on the other hand, may simultaneously give rise to water shortages, rising sea levels, famines, infectious diseases and natural catastrophes. It is the IPCC II working group's task to investigate how the effects of climate change may be tempered and how we might adjust to these changes.[48] The IPCC's 2007 report[49] compiles what measures of adaptation are necessary on the global, regional and local level in terms of water management, agriculture, health care, settlement patterns and infrastructure, tourism, transportation and energy sectors.

It is, of course, impossible to adapt to everything. Brett Parris of Monash University believes that the notion – which is accepted in Hungary – that we are moving from one stable state to another, to which we will also be able to adapt, is a misconception.[50] The growth in the concentration of greenhouse gases will lead to a situation that is anything but stable: it will result in an unpredictable and constantly changing state. It is true that as a result of climate change we may be able, for example, to produce better wines – which is the hope of domestic wine experts – at least temporarily.[51] However, it is also conceivable that the current viticultural areas will become desertified. We should also not forget that, for the most part, scientists tend to agree that climate change will most harshly affect the least developed countries.[52] Calculations suggest that by 2050 there may be as many as half a billion people in Africa who will not have access to adequate amounts of water. The melting of the Himalayan glaciers[53] will soon endanger the water supply of potentially as many as two billion persons, first and foremost in India and Bangladesh. Two billion people cannot adjust to the condition of not having access to sufficient potable and irrigation water. As a result of climate change, agricultural output in Central and South Asia could drop by as much as 30 per cent. While the consequences of climate change may therefore at least to some degree be manageable in Europe, including Hungary, they could lead to humanitarian catastrophes in the Third World. In an extreme scenario, a significant melting of the ice in Greenland or Antarctica could lead to a several-metre increase in sea level. If sea levels were to rise by a mere metre, on average, that would destroy the homes of 145 million people. Adapting to a several-metre rise in the sea level would cost considerably more than what we would have to spend on reducing greenhouse gas emissions. Adaptation alone cannot therefore constitute a solution, it can only serve as a supplement to emission reduction measures. In 2007, the European

47. Letter from the Working group Air [Levegő Munkacsoport] to the Deputy Undersecretary of State at the Ministry of Rural Development; 20 April 2011. Available at: http://levego.hu/sites/default/files/pm10_csokkentesi_intezkedesi_2011apr-velemeny.pdf

48. See: http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg2/010.htm

49. Page 57. http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

50. See: http://tinyurl.com/BPClimateFAQs

51. See: http://index.hu/tudomany/klima/2009/09/08/jobb_magyar_borokat_hozhat_a_klimavaltozas

52. See: http://www.nytimes.com/2009/04/16/science/earth/16degrees.html?_r=2&em

53. See: http://carbon-based-ghg.blogspot.com/2008/02/melting-glaciers-in-himalayas-imperils.html

Commission published a so-called Green Paper entitled Adapting to Climate Change in Europe – Options for EU Action,[54] which contains specific proposals.

The Commission argues that water supply, the reduction in biodiversity, food shortages, rising sea levels and new kinds of health problems will constitute the greatest challenges that require adaptation. The document stresses that even though the Third World will be more affected, Europe will not be spared the effects of climate change either. Southern Europe will become drier and hotter, the water output of rivers will decline, coastal areas will be threatened, extreme weather may damage infrastructure and all the above may have an indirect impact on financial services. Preparations have to be made therefore to ensure that the water supply remains stable, the problem that reduced need for heating will be accompanied by increased need for cooling and hence higher electricity usage and all the while more frequent storms and floods may threaten infrastructure. They call attention to the importance of early action that not only pre-empts damage but also endows European enterprises with a competitive edge. They stress that less costly »soft« measures (for example, water conservation, crop rotation, the use of drought-resistant species, central planning and consciousness raising). The Green Book also refers to construction techniques, materials and products that are climate change–resistant. The EU's study argues that disaster relief and warning efforts must be handled at the national level, while risk control measures – for example, mapping the endangered areas and drawing distinctions based on the potential impacts affecting them – need to be reinforced, and adaptation strategies need to be developed. The planning authorities at the regional level must design adaptation measures. At the local level, consciousness raising – for example, agricultural practices – and the planning and implementation of local measures (for example, water conservation measures) are necessary. EU-level measures are called for when a cross-border approach becomes necessary (for example, measures needed in the area of water reservoirs).

54. See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0354:FIN:HU:HTML

## 3.2 Risk Reduction Possibilities in Hungary and the VAHAVA Project

Domestic decision-making has designated two responsibilities in the context of overcoming climate change. On the one hand, it is necessary to reduce greenhouse gas emissions, and so is the drafting and implementation of adaptation strategies. The objective of this national mission is to mitigate the impact of anticipated adverse effects and the ensuing damage, as well as to draft scenarios for handling individual cases of damage.

The year 2003 saw the inception of the so-called VAHAVA project, initiated based on cooperation between the Ministry of the Environment and Rural Development and the Hungarian Academy of Sciences. VAHAVA stands for Change-Impact-Response (Változás-hatás-válaszadás in the Hungarian original), and the project is designed to investigate the domestic impact of climate change and the possibilities of adaptation, preparation, damage reduction and restoration. Several hundred scientists participated in the three-year project headed by member of the Academy István Láng. Within the framework of the VAHAVA project, the scholars involved examined the probable impact of climate change on individual fields and areas of professional expertise. In the course of their investigation, they considered the diverging susceptibilities of society, wildlife, landscapes and economic sectors, as well as their differing ability to withstand change and extreme impacts from said changes. The project's goal was to delineate the potential scenarios of climate change in the form of a report, as well as to create a variety of scenarios in terms of the potential impact of the aforementioned climate change scenarios.

One of the observations emanating from the project was the following: we need to brace ourselves for further warming and an increasingly dry climate, with more instances of extreme weather. The project summed up the necessary preparations and the corresponding proposals that are necessary for adapting to climate change. They noted that political and municipal decision-makers, the business sector and the general population must be prepared and adequately informed. Based on the results, they identified two objectives. The domestic economy and society must brace themselves for what will probably be a warmer and drier period, and at the same time the technical, financial and organisational groundwork

needs to be laid for rapid reaction measures that are suitable for preventing or coping with the harmful effects of unexpected extreme weather.

The original objective of the VAHAVA project was to develop the scientific basis of a National Climate Strategy. The National Climate Change Strategy (NÉS), adopted by Parliament at its 13 February 2008 session, was created on the basis of the project's insights. Based on the Strategy, successive governments draft, adopt and implement a Climate Change Programme every two years.

A national informational and coordination network, the VAHAVA Network, assists domestic research as well as economic, public policy, official, educational and civic activities associated with the project and related to climate change.

## 4. International and European Union Climate Change Policy

### 4.1 International Instruments

#### What Results Has the Kyoto Protocol Achieved?

The United Nations Framework Convention on Climate Change (UNFCCC) was signed in 1992 in Rio de Janeiro. It laid the foundations for combating climate change. Five years later, in 1997, numerous countries adopted the Kyoto Protocol, pursuant to which the 41 signatory states (Annex 1 countries) undertook to reduce their 2008–2012 greenhouse gas emissions by an average of 5.2 per cent compared to the 1990 level. The greatest emitter at the time, the United States, refused to sign the Protocol, while Australia failed to ratify the treaty, primarily based on the notion that the developed countries are not curtailing their emissions. By 2005, the emissions of the 145 countries that were considered less developed in 1992 exceeded those of the developed countries.

The emission targets were significantly exceeded. Spain, Canada and Ireland, for example, substantially increased their emissions despite their respective pledges, but at the same time the former Communist Central and Eastern European countries – regrettably, primarily on account of their collapsing heavy industry – met their targets.

#### What Can We Expect Post-Kyoto?

As yet there is no agreement on how the Kyoto Agreement, which will be effective until the end of 2012, will be continued. The goal of the ongoing international consultations is to adopt an emissions reduction plan for the post-2012 period. In 2007 in Bali, the so-called Bali Roadmap on long-term cooperation, emissions reduction, adaptation, technology transfers and financial issues was adopted. It was noted at the conference that the developed countries must achieve a 25–40 per cent reduction in their emissions, while the developing countries must exert a significantly greater effort if we are to hold warming at under 2°C. In 2009 the European Commission also emphasised that the efforts of the OECD countries are unsatisfactory in themselves, which is why it recommended that the bigger developed countries »reduce their carbon-dioxide emissions to 15–30 per cent less than the currently anticipated rate«.[55]

No agreement on real emission reduction was reached at the 2009 Copenhagen conference of the UN Framework Convention on Climate Change. The only development was that a few of the major emitters signed a statement declaring their agreement that the objective is to keep global warming under 2°C. Hungarian environmental groups (Védegylet [Protection Society], Greenpeace, Magyar Természetvédők Szövetsége [Association of Hungarian Environmentalists] and the green party Lehet Más a Politika [LMP – Politics Can Be Different]) demonstrated at the conference for the adoption of more ambitious targets.

For the time being China, which has since surpassed the United States as the greatest emitter of greenhouse gases, refuses to adopt mandatory emission limits.[56] Instead, similar to the other pre-eminent emitter, India, China adopted its own plan in 2009, which focuses on renewable energy.

After the 16th conference of the United Nations Framework Convention on Climate Change (COP 16) in Copenhagen, success once again eluded participants in the Mexican city of Cancun. All they managed to achieve was that the undertakings of individual countries were laid

55. See: http://www.euractiv.hu/gazdasag/linkdossziek/eghajlatvaltozas-a-koppenhagaba-vezeto-ut-000094

56. See: http://mno.hu/migr/kina-ratifikalja-a-kiotoi-jegyzokonyvet-766035

down and an agreement was reached on the establishment of a climate change fund.[57] The 2011 Conference of Contracting Parties (UNFCCC COP 17) was held in Durban, South Africa, from 28 November to 9 December. There the possibility of an agreement on mandatory emissions reduction was once again on the agenda. Green organisations, however, argue[58] that the undertakings of individual countries will not be sufficient to keep warming under 2°C; in fact they would allow for 3–4°C warming.

Unfortunately, there are increasing signs that the global economic crisis is superseding earlier objectives and ambitions concerning climate change, both at the international and the EU level,[59] even though most experts agree that preventing or alleviating climate change would be a good deal cheaper than subsequently seeking to remedy its harmful effects.

## 4.2 EU Climate Policy: EU Targets, Domestic Responsibilities

Already back in 2000 the European Commission launched the first European Climate Change Programme. In 2005, the Kyoto Protocol became effective in EU law as well. In the Kyoto Protocol the EU pledged an 8 per cent reduction in emissions by 2010, which it will probably meet. Altogether, the EU27 might even lower their emissions by as much as 13 per cent, thanks to the reduction attained by the former Socialist countries.[60] The year 2005 saw the beginning of the second European Climate Change Programme, while the EU also set up its own greenhouse gas Emission Trading Scheme (ETS).

In March 2007 the EU heads of state and government unilaterally undertook to achieve a reduction of 20 per cent in their greenhouse gas emissions by 2020. This was complemented by their pledge that if other developed countries were to commit to greater reductions, then the EU for its part would adopt an even more substantial, 30 per cent reduction target. The EU also pledged to increase the share of renewable energies to 20 per cent by 2020, and to improve energy efficiency by 20 per cent. The EU's leaders also expressed their support in principle for a 50 per cent reduction by 2050, as compared to the 1990 level.[61] The October 2009 session of the EU's Environment Council adopted an even more ambitious target, when it affirmed an 80–95 per cent emission reduction goal by 2050.[62]

The EU's 2010 review of the state of biodiversity declares that only in 17 per cent of reviewed habitats are protection statuses adequate, while as many as 25 per cent of all animal species in the EU are threatened by extinction. The previous EU target was to halt the decline in biodiversity by 2010. This target, which is connected to climate change, has not even remotely been met, however. The Commission drafted a new working paper[63] containing a strategy that lays down how the EU should proceed until 2020 to stop the decline in biodiversity.

## 4.3 Domestic Climate Politics

### Hungary and International Climate Politics

Within the framework of the Kyoto Protocol, Hungary undertook to lower its emissions by 6 per cent compared to the average of the years 1985–1987. Hungary ratified the Protocol in 2002 and promulgated it in Act IV of 2007. For now, Hungary is performing even better than pledged: domestic emissions were 34 per cent lower[64] than the base level established for Hungary in the Kyoto Protocol. Reduced Hungarian emissions are also predominantly due to the collapse of communist heavy industry and agricultural production. Already by 1992, Hungarian greenhouse gas emissions dropped by some 30 per cent. In the reference period of 1985–1987, Hungary emitted 115,571 tonnes of carbon-dioxide equivalent, while in 2005 the value was 80,219 million tonnes, a decline of

57. See: http://www.uneca.org/eca_resources/press_releases/2010_pressreleases/pressrelease10610.html

58. See: http://wwf.hu/hirek/aktual/1/ketyeg-a-klimaora-bonntol-komoly-elorelepest-varnak

59. See: »Where Did Global Warming Go?«. Available at: http://www.nytimes.com/2011/10/16/sunday-review/whatever-happened-to-global-warming.html?_r=1&partner=rss&emc=rss

60. See: http://www.bruxinfo.hu/cikk/20091112-tulteljesitheti-kiotoi-vallalasait-az-eu.html

61. See: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0354:FIN:HU:HTML

62. See: http://europa.eu/rapid/pressReleasesAction.do?reference=IP/09/1561

63. See: http://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/sec_2011_541/1_HU_resume_impact_assesment_part1_v2.pdf

64. J. Feiler and D. Ürge-Vorsatz (2010), Hosszú távú (2050) kibocsátás csökkentési célok Magyarország vonatkozásában [Long-term (2050) emissions reduction targets in the Hungarian context]. Available at: http://www.nfft.hu/dynamic/Hosszu_tavu_kibocsatas_csokkentesi_celok_Magyarorszag_vonatkozasaban.pdf

30.6 per cent.[65] After 2005, emissions dropped primarily on account of the economic crisis.

Experts argue that Hungary still has considerable spare capacities in terms of emission reduction, particularly in the form of energy conservation, developing energy efficiency and utilising renewable energy. Moreover, all the above also yield specific economic benefits: reducing per unit energy usage improves productivity, increases security of energy supply and makes Hungary less dependent on energy imports.

### Hungary and EU Climate Policy

The 20 per cent greenhouse gas emission reduction target adopted by the EU in 2007 in practical terms constitutes an undertaking for Hungary to makes an 18.3 per cent emission reduction, compared to the 1990 base value. Compared to the 20 per cent renewable energy target set by the EU, Hungary only has to achieve a ratio of 13 per cent by 2020. If Hungary had to meet a 30 per cent reduction target by 2020, according to a study by the National Sustainable Development Council, it would need to purchase emission credits.[66]

The cabinet adopted the National Climate Change Strategy (NÉS) for 2008–2025 in February 2007.[67] The Strategy delineates the responsibilities stemming from Hungary's international emission reduction undertaking, as well as tasks related both to the struggle against the causes of climate change and adaptation to the latter. Pursuant to the NÉS, over 100 billion forints are available for climate protection–related investments until 2013. Several domestic climate change scenarios were also drafted as part of the NÉS.[68] The NÉS is in accordance with the target system of the EU's climate/energy package adopted in 2008.

In autumn 2008, the Cabinet adopted the Renewable Energy Strategy, which in its so-called »public policy« scenario estimates a 13–15 per cent ratio of renewable energy by 2015, while assuming an 11–13 per cent ratio in its standard course of events scenario.

65. http://index.hu/gazdasag/magyar/kioto070624/

66. J. Feiler and D. Ürge-Vorsatz (2010), Hosszú távú (2050) kibocsátás csökkentési célok Magyarország vonatkozásában [Long-term (2050) emissions reduction targets in the Hungarian context].

67. See: http://klima.kvvm.hu/index.php?id=14

68. See: http://klima.kvvm.hu/documents/14/NES_6.4c.pdf

### Impact of Other European Union Countries on Hungarian Climate Policy

In the process of debating and adopting the EU's 2008 climate package, the new EU member states – which compared to the 1990s had realised a reduction in the emission of greenhouse gases on account of the collapse of their heavy industry – lobbied for consideration in the 2020 targets also of the results of emission reductions achieved by individual member states between 1990 and 2005.[69] Jointly with Bulgaria, Romania, Latvia, Lithuania and Slovakia, Hungary introduced proposals aimed at lowering the emission reduction targets they would have to meet in the future.

Poland, where 90 per cent of energy production is provided by coal-fired power plants, as well as Germany, which boasts substantial heavy industry, managed to obtain a concession during the adoption of the EU's 2008 climate and energy package, namely that certain energy and heavy industry sectors be exempt from emission restrictions for the time being. Supporting the Poles, the Socialist government in Hungary argued for substantial free emission quotas, thanks to which the Hungarian energy sector also received free emission units from 2013 on.[70]

## 4.4 Emissions Trading

The Kyoto Protocol provides numerous opportunities for trading carbon dioxide emission quotas. Among these is the possibility that if a country reduces its emissions by more than prescribed, it may sell a portion of the difference to a country that failed to meet its quota.

### EU Emissions Trading

Directive 2003/87/EC, which was introduced in Hungary in the process of EU accession in 2004, delineates the rules for trading in EU carbon dioxide emission units. The EU's emissions trading scheme is the first market-based regulatory instrument that provides for the possibility of cost-effectively reducing greenhouse gas emis-

69. See: http://www.bruxinfo.hu/cikk/20081208-klimacsomag-nem-teszik-le-a-fegyvert-az-uj-tagallamok.html

70. See: http://www.bruxinfo.hu/cikk/20081212-gyurcsany-az-utolso-percig-blokkolta-a-klimaalkut.html

sions within the EU, thereby helping to achieve the 8 per cent emission reduction pledged by the EU in the Kyoto Protocol. In principle, that is, they reduce greenhouse gas emissions where such reductions may be achieved most cost-effectively. Based on the Directive, all member states have to determine each year the upper limit of the total carbon dioxide emissions of their emission-producing installations, which will be distributed among installations following the National Distribution Plan in the form of emission units.[71] Over 200 installations in Hungary received carbon dioxide quotas. These installations need to account for their emissions each year. If the emissions exceed their respective quotas, then they either have to purchase emission units or pay a hefty fine. If they retain a surplus of units, they may sell their quotas.[72]

The new climate change package retains the emissions trading scheme. The distribution plan for Hungary's carbon dioxide quota between 2008 and 2012 was published on the EU's official homepage in 2009: Hungarian companies may trade a quota of 30.8 million tonnes annually.[73]

#### Hungarian Quota Sales

By selling 40 billion forints worth of quotas, Hungary ranked first in the world in 2008–2010. In 2008, it sold two million tonnes of carbon dioxide to Belgium and another six tonnes to Spain. Although the details of the individual deals were not disclosed, what is known is that quota sales brought in 28.2 billion forints in 2008. In 2009, Hungary sold quotas worth another 8 billion forints. According to information provided by the government, 14.5 billion forints stemming from the sale of quotas were set aside to fund the programme that issues tenders for modernising panel buildings.

The March 2010 quota sales in Hungary was greeted in the Hungarian media as somewhat dubious. A carbon dioxide quota, which the Ministry of the Environment valued at 4 billion HUF, was initially sold to Japan via a trading house in Hong Kong, but ended up back in the EU again. Although the sale did not violate the rules, the quota should not have resurfaced in the EU market. Thus the EU stopped the trade.[74] The EU launched an investigation and barred speculative trade in carbon dioxide quotas. Legal provisions ensured that sold quotas may not resurface in the EU.

Hungary continues to sell carbon dioxide quotas. Minister of National Development Tamás Fellegi estimates that the sale of EU carbon dioxide quota units will yield revenues of 6–8 billion forints by the end of 2012.[75]

## 5. Climate Change Policies of Political Parties in Hungary

### 5.1 Climate (and Energy) Policies of FIDESZ and the Hungarian Government

#### Policies during the Previous Parliament

Like the then governing party MSZP, during the previous Parliament FIDESZ also took the stance that the year of reference for Hungary's reduction requirements ought to be 1990 rather than 2005, and hence the reduction resulting from the collapse of heavy industry should be taken into account and, correspondingly, emissions should be expected to be reduced by less. MEP András Gyürk introduced amendments to this effect in 2008.[76]

Chairman of the Parliament's Environmental Committee during the previous term was the FIDESZ MP Andor Nagy. Before the April 2010 elections, Nagy stated in February[77] that FIDESZ had drafted a programme entitled Green Hungary for developing the green economy, because in his view this type of economy could mark a way out of the current and ongoing crisis. The programme suggested that if the green economy were to emerge as a growth sector, it could create as many as 200,000 jobs. New jobs may be realised in the following areas: modernisation of buildings, improved energy effi-

71. See: http://www.origo.hu/uzletinegyed/hirek/20060123azemisszioker eskedelem.html?pIdx=1

72. See: http://www.bruxinfo.hu/cikk/20081215-hogyan-mukodik-az-emisszio-kereskedelmi-rendszer.html

73. See: http://fn.hir24.hu/vallalkozas/2009/04/28/ujraindulhat_emisszio_kereskedelem

74. See: http://www.origo.hu/itthon/20100320-kvotabiznisz-szendioxid-tozsdek-a-vitatott-magyar-kvotaeladas.html

75. See: http://zoldtech.hu/cikkek/20110122-kvota-ertekesites

76. See: http://gyurk.fidesz-eu.hu/interju/kiszolgaltatott_helyzetben_van_magyarorszag/

77. See: http://index.hu/belfold/2010/valasztas/nagy_andor_az_elmult_evtizedet_elszurtuk/

ciency and the development of energy efficient systems. The politician emphasised that it would be important to continue selling and using the remaining carbon dioxide quotas after the expiration of the Kyoto Protocol as well.

## 2010 Election Manifesto and the Implementation of Campaign Pledges

In its 2010 election manifesto[78] FIDESZ emphasised climate change-related responsibilities from several angles. The party's view was that »Hungary needs to promote the realisation of the European initiative in the area of energy-efficient building in the construction industry, which is geared towards subsidising green technologies as well as the development of energy efficient systems and materials in new and modernised buildings.« The election manifesto noted that by modernising 10 per cent of the entire housing stock annually, the programme could create 80,000 new jobs in construction. This would help the sector and, moreover, the investment would pay off within ten years. In practice, however, this programme is being launched with great difficulties. The tenders on energy efficient modernisation, which have been around for a few years already, have been published with considerably slimmer funds than previously, and in fact within a few days the money-deprived tender had to be halted. There are promises holding out the prospect of later tenders.

FIDESZ also pledged state and municipal funds for energy efficiency investments. The programme would subsidise residential tower block modernisation and renewable energy investments – pre-eminently geothermic and wind energy exploitation – through a »green bank«. The funds expended on these projects have thus far not been increased as compared to the support scheme delineated by the previous New Hungary Development Plan (Új Magyarország Fejlesztési Terv – ÚMFT). The programme devotes a separate section to the necessity of exploiting what it deems abundant resources in Hungary, in other words, solar, geothermic and bio-energy. The programme's chapter on agriculture also stresses that it is important that agricultural production only burden the environment to the minimum extent possible. The programme furthermore pledges to create – an as yet unimplemented – a green public procurement programme, the task of which is to integrate environmental considerations in development policy.

Before the elections, environmental organisations (Duna Charta, Levegő Munkacsoport, Greenpeace, Magyar Természetvédők Szövetsége, Védegylet, WWF) put twelve environmental questions to the larger parties. One of these questions addressed their attitude towards climate change.[79] In response to the questions, FIDESZ merely provided the organisations with a brief letter that failed to address climate change.

## The FIDESZ Government's Climate Policy

The FIDESZ government scrapped the separate Ministry of the Environment, incorporating it into the ministry responsible for regional development. In many respects, the latter ministry represents interests antithetical to environmental concerns. Thereafter, news spread that experts that had dealt with climate change at the ministry had been given notice. The government denied this in a statement:[80] »[T]he climate policy department of the former Ministry of the Environment was transferred in its entirety into the Ministry of National Development, where – in light of the preparations regarding [Hungary's rotating EU] presidency – it was significantly enlarged in terms of its staff numbers.« The new State Secretary's Office of Climate and Energy Affairs in the Ministry of National Development (NFM) was set up by drawing on the areas involving climate and energy policies that had previously been part of the two separate ministries. János Bencsik, formerly the climate-conscious mayor of Tatabánya, was appointed state secretary in charge of the office in 2010, while former MEP Péter Olajos, who had previously been active in the Environmental Committee, became his deputy in charge of climate affairs.[81]

78. See: http://aeco.hu/valasztas-2010-partok-zold-programja/

79. »What measures will you take to simultaneously address the unfavourable effects of climate change and the economic crisis? What emission targets do you envision for Hungary in relation to greenhouse gas emissions for 2020 and 2050, taking 2005 as the base year?«
Available at: http://wwf.hu/archivum/2010ev/2/civilek-kerdesei-partok-valaszai

80. See: http://www.kormany.hu/hu/nemzeti-fejlesztesi-miniszterium/klima-es-energiaugyi-allamtitkarsag/hirek/magyar-kartya-a-mexikoi-klimapartiban

81. See: http://www.origo.hu/uzletinegyed/hirek/20101120-nfm-megalakult-a-klima-es-energiaugyi-allamtitkarsag.html

Minister Tamás Fellegi initially sought to make a joint EU position on climate one of the priorities[82] of the Hungarian presidency. It is not the Hungarian government's fault that the EU member states ultimately failed to come to an agreement under the rotating Hungarian presidency in the first half of 2011 regarding the stance they should adopt in international climate politics. Even though 26 states assented to the relevant plan, the Poles vetoed it.[83]

The New Széchenyi Plan, which was introduced to replace the New Hungary Development Plan, also offered energy efficiency subsidies within the framework of Environment and Energy Operational Programme tenders. The government strove in principle[84] to support the poorest municipalities – those that as a percentage of their revenues are often compelled to pay most for the energy consumed – which is why the calls for tenders on the modernisation of buildings and the improvement of the efficiency of communal heating systems were published in this spirit. The Ministry of National Development launched its Green Investment Scheme (ZBR) in June 2011.[85] The scheme's objective was to ensure that income from quota sales based on the Kyoto Protocol would be devoted in its entirety to climate change related objectives.

In autumn 2011 the government adopted the New National Energy Strategy.[86] The objective of the energy strategy applicable to the period up to 2030 is to reduce energy dependence and to ensure sustainable energy supplies.[87] The strategy calls for increasing the share of renewable energy from the current 7 per cent to 20 per cent by 2030, and also for reducing total consumption and increasing energy efficiency. It wishes to ensure the security of energy supplies through energy conservation; nuclear energy; an agriculture that shifts between food and biomass production for energy creation, always focusing on what serves sustainability best; a closer connection to the European energy market; and increasing the proportion of renewable energy resources in Hungary. During the proposal's debate the opposition MSZP argued that a consultative referendum should be held on the post-2030 fate of the nuclear reactor in the town of Paks. MSZP further called for improved use of energy that could be extracted from the by-products of animal husbandry and for increasing geothermic capacities. Christian Democratic (KDNP) MP András Aradszki noted in the debate that the necessary objective was to reduce our energy need by 30 per cent. LMP thought that the renewable energy objectives were not ambitious enough, since the cost of renewable energies is steeply declining. The party's parliamentary faction further criticised that the Energy Strategy predominantly relies on biomass, even though there is significant potential also in the areas of wind and geothermic energy. LMP also believes that in supporting nuclear energy, the government ignores the investment costs. During the parliamentary debate, János Volner of Jobbik called attention to the importance of renewing public transport.

## 5.2 MSZP and the Previous Government's Climate (and Energy) Policy

The National Climate Change Strategy (NÉS) for 2008–2025 – discussed in Section 4.2 above – and the Renewable Energy Strategy were adopted under the previous government, in 2007 and 2008, respectively. During the negotiations at the climate and energy summit the goal of the Socialist government was to ensure that the new member states would be awarded substantial free emission quotas in exchange for having significantly lowered their emissions after 1990 because of the disintegration of their heavy industry. The Hungarian government's achievement was to ensure that the »domestic energy sector was temporarily exempted from carbon dioxide quotas: from 2013 on, instead of the generally applicable 100 per cent auction purchases the domestic energy production installations only have to pay for 30 per cent of their emission quotas, while they will receive 70 per cent of their emission quotas for free, reaching the 100 per cent level only in 2020.«[88]

Prime Minister Gyurcsány viewed it as a success of his government that »in those sectors falling outside the range of emissions trading (for example transportation),

82. See: http://www.fideszfrakcio.hu/index.php?Cikk=164463

83. See: http://www.origo.hu/uzletinegyed/hirek/20110707-fellegi-tamas-fejlesztesi-miniszter-nezopont-intezet-az-euelnokseg-kulisszatitkai-rendezvenyen.html

84. See: http://www.fideszfrakcio.hu/index.php?Cikk=162816

85. See: http://www.fideszfrakcio.hu/index.php?Cikk=163895

86. http://www.klimatorveny.hu/

87. http://zoldtech.hu/cikkek/20110913-energiapolitika

88. See: http://www.bruxinfo.hu/cikk/20081215-felemas-magyar-merleg-a-klimatargyalasokon.html

Hungary may increase its emissions by 10 per cent between 2005 and 2020. If it pollutes below the permitted level, then it may attain an income of up to a billion euros over eight years from selling unused quotas.«[89]

The government further managed to ensure that Hungary would have to raise the proportion of renewable energies to merely 13 per cent of the total energy consumption by 2020, rather than the general objective of 20 per cent.

Environmental and climate protections issues figured in MSZP's 2010 election manifesto.[90] The chapter on job creation mentions the possibility of using biomass for energy purposes. Specifically, it says that »Hungary also needs a new programme, a »greener« economic policy. Following the »New Deal«, which energised the economy after the previous global crisis, we now express our demand for another, »Green New Deal«. Development plans will be approved only if they meet the criteria of sustainability. We cannot exhaust the future of coming generations. We need to take into account the changes in environment and climate, the exhaustion of traditional sources of energy, and we cannot approve any plans that exacerbate these dangers.«

In response to the twelve questions[91] raised by environmental organisations in advance of the elections, MSZP provided detailed answers. In answering the question on climate change, it noted that its ideas for the long-term handling of climate change were encapsulated in the National Climate Change Strategy (NÉS). It emerges from MSZP's answer that Hungary needs to realise a climate and energy policy that best serves Hungarian interests, and which simultaneously contributes to emission reductions and, in the process, to energy conservation and the spread of renewable energy.

After the 2010 elections, under the chairmanship of Attila Mesterházy, green issues were given greater emphasis in MSZP's policies, which is also indicated by the articles, parliamentary speeches and conferences on the issue. MSZP's chairman believes that there is significant potential in a green turn for the domestic economy and for job creation in Hungary: »It is obvious that there are vast innovation and R&D opportunities, in fact even the possibility of the emergence of a new green economy, which will make development sustainable, since this economy will be able to provide a lot of people with jobs that are both socially and environmentally useful, all the while burdening the environment less.«[92]

## 5.3 Jobbik's Climate (and Energy) Policy

Already before the 2009 European Parliament elections Jobbik/Movement for a Better Hungary focused on environmental and climate politics issues in its communications. It addressed these issues primarily in the context of protecting and preserving domestic agriculture, however. In the party's 2009 EP election manifesto,[93] it emphasised the protection of the Pannon bio-geographic region from climate change. The manifesto stressed the importance of traditional agricultural cultivation techniques, which »are capable of averting the consequences of global climate change that threatens devastating cataclysms, and which thereby secure the population's chances of survival, providing physical and food safety.« It also noted the strategic importance of water management and that climate change is the »greatest risk factor for Hungarian agriculture, and may over a period of five years result in variations in harvest yields that diverge from the mean by over +/– 25 per cent.« The party's programme does not address, however, what emissions reduction or risk management measures they would support.

During the EU's climate negotiations, Jobbik's MEP Zoltán Balczó – similar to FIDESZ's and MSZP's communication – emphasised[94] that the EU owes its ability to satisfy its commitments under Kyoto to the recently acceded member states' reduction in industrial pollution emissions. Balczó also agreed that it would be beneficial for Hungary if it were able to sell its excess capacity under the Kyoto requirements in the framework of the emissions trading scheme.

89. See: http://www.bruxinfo.hu/cikk/20081212-gyurcsany-az-utolso-percig-blokkolta-a-klimaalkut.html

90. See: http://aeco.hu/valasztas-2010-partok-zold-programja/

91. See: http://wwf.hu/archivum/2010ev/2/civilek-kerdesei-partok-valaszai

92. See: http://mesterhazyattila.hu/hirek/zoeldet-pirosra

93. See: http://www.jobbik.hu/sites/jobbik.hu/down/Jobbik-program2009EP.pdf

94. See: http://www.jobbik.hu/rovatok/ep-kepviseloink_hirei/balczo_zoltan_milyen_demokraciat_hangoztat_az_eu

In its manifesto[95] drafted for the 2010 parliamentary elections, Jobbik also stresses the importance of climate protection, adding that it needs to be realised by excluding commercial interests. With regard to stimulating the consumption of domestic foodstuffs, Jobbik emphasises the importance of not transporting food over great distances. It notes in the manifesto that it wishes to scale back invasive plants, such as ambrosia, and will design a programme to protect natural habitats and will seek to improve the efficiency of existing solid fuel plants. Although it does not contain specifics, the manifesto also lays down Jobbik's aim of gradually increasing the share of renewable energy, whose spread it wishes to stimulate by offering benefits. It is unclear from the manifesto whether this growing ratio and the benefits mentioned exceed the relevant legal provisions and schemes already in place. In its manifesto, Jobbik emphasises that it would do away with the quota scheme and would design an efficient climate protection package, helping carbon dioxide absorption by promoting the plantation of forests with indigenous tree species. As a result of EU laws and our participation in the Kyoto Protocol, Hungary is party to the quota scheme. It is unclear what quota system Jobbik would abolish.

Following the 2010 elections, the environmental cabinet and the EP delegation of Jobbik/Movement for a Better Hungary stressed in a joint statement[96] that »radically curtailing the impact of climate change and reducing our carbon dioxide emissions is our joint responsibility. Reducing carbon dioxide emissions is also advantageous in economic and health terms, among other things.« They noted that regional and local level regulations would be needed, as well as a comprehensive strategy by 2012. Once again they failed to mention specific measures, they merely emphasised anew that steps have to be taken against wasting water, that water management needs to be regulated more efficiently and that it needs to be examined how agriculture and forests will be affected.

## 5.4 LMP's Climate (and Energy) Policy

From the very beginning of its entry into politics, LMP's climate policies have reflected the values that are typical of green parties. LMP's manifesto for the 2009 EP election[97] also contained a chapter entitled Climate Protection and Energy, which stressed that the party's goal is for the EU to take the initiative on an international climate policy that mandates radical emissions reductions. They argued that for Hungary the key is to substantially improve energy efficiency.

As an ecological party, LMP titled its 2010 parliamentary election manifesto[98] A Strategy for a Sustainable Future, An Inclusive Society and a Renewed Democracy. The basis of LMP's economic programme is to attain growth while reducing resource use and pollution. According to LMP this would be achieved by developing human capital through education and other incentives rather than providing stimulus for the growth of sectors with substantial raw material and energy demand. LMP wishes to scale back the use of resources and energy by introducing green taxes. Similar to the other parties, LMP would also favour investments that create green jobs. The programme stressed that in the European Parliament »we have to support the initiative of the European Green Party, which proposes separate regulations for short distance food transport«.

LMP believes that a sustainability strategy is necessary. One component of this would be a proportional tax on pollution stemming from transportation, and a carbon tax based on real pollution. In the context of bracing ourselves for climate change, LMP's manifesto proposes water management and land use solutions that will make it possible to locally capture rainwater, and the selection and reuse of used water.

In response to the abovementioned climate change related questions put forth by environmental organisations, LMP responded that energy efficiency would have to be drastically improved, the use of renewable energy should be promoted and the commitments laid out in the NÉS should be realised. As an emission target for 2050, LMP supports the European Union's target: 2 tonnes per head.

LMP's proposals since the elections have also been consistent with the recommendations of European green

95. See: http://www.jobbik.hu/sites/jobbik.hu/down/Jobbik-program-2010OGY.pdf

96. See: http://www.jobbik.hu/rovatok/ep-kepviseloink_hirei/a_jobbik_ep-delegacioja_a_klimavaltozasrol

97. See: http://lehetmas.hu/img/lmp+ep+program.pdf

98. See: http://lehetmas.hu/upload/9/9/201003/LMP_Program_2010_1.pdf

parties. In other words, it would seek to realise a 30 per cent reduction in emissions by 2020 and a substantial economic transformation to stimulate the shift to a green economy. Most of the ideas advanced by LMP have found their way into the party's budget proposal for 2012. At the core of this proposal lies an Ecological tax reform, which includes numerous tax increases (LMP would levy a capital, wealth and environment consumption tax), including raising fuel taxes and taxes on other types of consumption that damage the environment, as well as the abolition of tax credits in these areas.

In transportation, LMP would, among other things, like to introduce a freightage road toll and a general carbon tax on fuels. It also seeks the abolition of the excise-duty allowance on agro-fuels and would do away with commercial diesel fuel prices and reform motor vehicle taxes with an environmental approach. Air travel taxes and mining fees would rise. In addition to supporting several areas not connected to the environment, LMP proposes to use the revenues thus collected to set up two funds to help green job creation, the Green Investment Fund and the Community Economic Development Fund.

### 5.5 Proposals by Civic Organisations and Other Stakeholders

Several domestic civic organisations seek to combat climate change and to realise a greener climate policy. WWF Hungary[99] operates a variety of programmes that promote climate consciousness in the general public, and the organisation is also engaged in the climate policy debate. The Working Group for Air (Levegő Munkacsoport)[100] provides the public and decision-makers with climate-friendly proposals in the areas of energy, transportation, taxation and urban development. The Energy Club (Energia Klub), which previously operated as a civic organisation that conducted public campaigns to promote its goals, is now a professional group pursuing energy efficiency and energy conservation, as well as spreading renewable energy. In November 2011, Greenpeace Hungary introduced the possibility of replacing fossil and nuclear energy in Hungary within the framework of its programme entitled Energy Revolution.

In recent years the Alliance of Hungarian Environmentalists (Magyar Természetvédők Szövetsége – MTVSZ) was the most active group in the area of climate politics. They launched their climate bill[101] in autumn 2008, and it received support from over 15,000 citizens and 500 civic organisations. The bill drafted by the environmental organisation was finally presented to Parliament in February 2010,[102] but ultimately it was not adopted. The goal of the climate bill is to reduce the use of fossil energy resources at our disposal, and it would achieve this objective by introducing a socially just resource quota. Pursuant to the MTVSZ' proposal, »[b]ased on the applicable quota, we could initiate energy conserving or renewable investments in green markets, that is in markets for environmentally friendly goods and services. If the saved quota proves insufficient to support an investment, financing for the latter would be made available interest-free by the revolving fund. Our energy savings would reduce individual consumption and the investments would benefit Hungarian SMEs. Thus everyone would receive advantages from green economic stimuli.«

## 6. Possibilities and Proposals for Shaping Hungarian Climate Change Policy

According to a summary prepared in November 2011, greenhouse gases emitted by humanity reached their all-time peak in 2010.[103] Despite the Kyoto Protocol, emissions in 2010 grew by 6 per cent compared to 2009. This growth is significantly larger than what the IPCC anticipated in its worst-case scenario. A substantial portion of the increase does not stem from OECD countries but from emerging economies in Asia and South America.

Although Hungary is responsible for a mere 0.2–0.5 per cent of global greenhouse gas emissions, its per capita emissions are still significantly higher than the global average. Thus even beyond its responsibilities in terms of adaptation, laid out within the framework of the NÉS, the VAHAVA project, the New National Energy Strategy and the various EU documents, Hungary must make contributions in terms of reducing global greenhouse

99. See: http://wwf.hu/klimavaltozas

100. See: http://levego.hu/tevekenysegeink/eghajlatvedelem_energia

101. See: http://www.klimatorveny.hu/

102. See: http://lmv.hu/node/5068

103. See: http://www.guardian.co.uk/environment/2011/nov/04/greenhouse-gases-rise-record-levels

gas emissions. On account of Hungary's vulnerability, its existential interest is also to push for stricter international emission reduction policies, in addition to embracing reductions at home.

## 6.1 Emission Reduction

According to the 5th National Report submitted in compliance with the requirements of the United Nations Framework Convention on Climate Change, by 2020 Hungary has to lower its emissions by 35 per cent compared to the 1990 level. The document notes that the introduction of further measures would, in theory, allow for the realisation of even greater reductions. Pursuant to the plans enunciated in the National Climate Change Strategy,[104] by 2050 Hungary's energy consumption could decline by a maximum of 70 per cent. According to the NÉS's calculations, 5 per cent of the energy currently used will be sufficient to produce hot water and a similar reduction is possible in the case of heat consumption used by industrial processes. A significant proportion of energy consumption is used in buildings. The NÉS's projection is that 40 per cent of the domestic stock of buildings will be passive housing by 2050, meaning that they will not emit any greenhouse gases. With efficient modernisations, the emissions of traditional houses may be reduced by as much as 75 per cent.

The NÉS[105] designates the following emissions reduction targets and responsibilities:

- the use of fossil energy resources must be reduced;
- in the medium term, energy consumption must be maintained at the current level, and subsequently it must be significantly reduced;
- an energy conservation movement must be launched;
- fiscal policy must be redesigned with a view towards climate protection;
- the share of renewable energy must be increased to 186.5 PJ by 2020;
- examinations reviewing cogeneration's suitability for use must become more stringent;
- rather than offering citizens in need compensation for energy prices, the affected segment of the public should be helped to save energy more efficiently;
- the lowest acceptable fuel efficiency standard applicable to the use of biomass for energy purposes must be increased;
- the support scheme for the production of electric power through renewable energy must be designed in a way that allows for supplanting the greatest possible quantity of fossil fuels;
- the current share of public transportation must be maintained;
- combined transport needs to be developed and its share of total transport needs to be increased;
- urban and suburban public transportation must be developed;
- a road toll system must be set up;
- the practice of waste management must be improved;
- the large-scale recycling of products with high energy need is necessary;
- waste consisting of foodstuffs must be turned towards use as biogas.

The experts at the Ministry argue that Hungary, too, could meet an 80 per cent emission reduction target by 2050, partially in view of the fact that estimates suggest the Hungarian population will fall to 8.9 million (from 10 million currently) by 2050. The document also projects that the role of electric power will grow within the energy sector. In addition to renewable energy, the projections also assume that nuclear energy will play a role, and carbon capture and storage (CCS) will spread. Table 1 presents the possibilities for reducing greenhouse gas emissions.

104. See: http://klima.kvvm.hu/documents/14/NES_6.4c.pdf

105. J. Feiler and D. Ürge-Vorsatz (2010), Hosszú távú (2050) kibocsátás csökkentési célok Magyarország vonatkozásában [Long-term (2050) emissions reduction targets in the Hungarian context]. Available at: http://www.nfft.hu/dynamic/Hosszu_tavu_kibocsatas_csokkentesi_celok_Magyarorszag_vonatkozasaban.pdf

Table 1: Emission reductions up to 2050, by sector

| Sector | 2007 | 2050 | 2050 | Explanation |
|---|---|---|---|---|
| | CO2 equivalent million tonnes | Reduction in per cent | CO2 equivalent million tonnes | |
| Power plants | 18,396 | 80 | 3,679 | CCS + technological potential for reduction exceeds 95 per cent |
| Industry – energy consumption | 10,081 | 15 | 8,569 | CCS for the larger emitters? + increasing energy demand on account of the latter + shift to renewables + end of oil refining? |
| Industry – technology | 5,395 | 60 | 2,180 | CCS for the larger emitters? Cement, lime, iron manufacture, limestone use in power plants; ending whipped cream chargers; CO2 from anaesthetic gas, cooling and air conditioning systems remains; use of other F-gases remains, remaining direct incineration partially electric |
| Transportation – public roads | 12,641 | 95 | 632 | Renewables, electric cars, fuel cell vehicles |
| Transportation – road, shipping | 194 | 100 | 0 | |
| Agriculture – energy consumption | 1,097 | 95 | 55 | Making buildings passive, machines mainly run with renewable energy |
| Agriculture - technology | 9,477 | 17 | 7,880 | Pig population –40 per cent, halving emissions from artificial fertilisers |
| General population – energy consumption | 8,450 | 95 | 207 | Average building transformed at least into a passive house (in certain cases with 0 emissions) – 45 per cent efficiency improvement, 90 per cent of heating from electric power |
| Waste | 4,136 | 95 | 207 | CCS at incineration? Methane recovery at landfills, which is used to produce energy, similarly in wastewater treatment |
| Other consumers – energy consumption | 3,913 | 95 | 196 | Average building transformed at least into a passive house (in certain cases with 0 emissions) – mostly building-related emissions |
| Energy – technology (fugitive) | 2,165 | 95 | 108 | End of domestic oil and natural gas production and of associated emissions, there won't be need for underground gas storage; brown coal mining remains with ca. 0 emission; due to lack of use by general public leakage of gas networks ends |
| LULUCF | -4,138 | 0 | -4,138 | Remains in spite of constant forestation – because of climate change LULUCF sector becomes in fact emitter to an increasing degree |
| Total | 71,806 | | 19,790 | |

Source: J. Feiler and D. Ürge-Vorsatz (2010), Hosszú távú (2050) kibocsátás csökkentési célok Magyarország vonatkozásában [Long-term (2050) emissions reduction targets in the Hungarian context]).

The reduction of domestic greenhouse gas emissions may be served well by the climate bill[106] that MTVSZ had drafted (discussed in Section 5.5) – which has, however, not been adopted yet – and particularly by the resource quota, green market and revolving fund contained in it. The New National Energy Strategy mentioned the quota system proposed by the climate bill as a potential instrument, but there are no guarantees whatsoever of its implementation.

The autumn of 2011 saw the publication of the volume entitled This is the way forward! Vision 2040 Hungary 1.1 (Erre van előre! Vision 2040 Hungary 1.1),[107] com-

106. See: http://www.mtvsz.hu/klimatorveny_a_fenntarthato_tarsadalomert_torvenytervezet

107. See: http://www.legszennyezes.hu/errevan.pdf

piled under the direction of the Environmental and Landscape Ecology Faculty at Budapest's ELTE university. The study explores Hungarian greenhouse gas emission options by giving special consideration to domestic conditions and possibilities. Based on their one and half years of research and computer modelling, the authors claim that by 2040 it is even conceivable that 100 per cent of Hungary's energy needs could be supplied by renewable energy. This is possible if an optimistic scenario were realised which »assumes optimal conditions from a bureaucratic perspective«. The study notes that this goal may be achieved by relying on three pillars: energy efficiency needs to be improved and there should be an increasing focus on energy conservation and the use of renewable energy resources. The researchers argue that there is considerable potential in improving energy efficiency: within a span of 30–40 years, even the technological instruments already available will allow for an efficiency improvement of 400 per cent, in some instances even 1,000 per cent. By 2050, the country's entire energy demand could therefore be reduced from its current level of 1,086 PJ to 480 PJ in 2040 and, finally, 296.6 PJ. The 2040 target level is comparable to the British and Danish scenarios, which anticipate a 55 per cent reduction. Energy conservation demands that decision-makers embrace a new approach, since low gas prices and regulations favouring car use do not sufficiently communicate to the public the importance of energy conservation. We need therefore a legal environment that provides incentives for energy conservation both from an economic and a regulatory perspective.

The third pillar is the use of green energy. The researchers stress that several of the current uses of green energy – especially bio-energy – are not sustainable. But the authors note that »in contrast to earlier assumptions, renewable energy resources are indeed at our disposal in sufficient quantities to meet the energy needs of a society that employs high technology reasonably«. The study says that the production of renewable energy may be increased to 480 PJ by 2040, which could then cover the entire energy supply; that is, we would be able to supplant nuclear energy and fossil fuel use. This scenario projects that the share of electric power will increase as a ratio of total energy consumption, but at the same time total usage will not grow as all the other types of energy will be used less. The study argues that among the renewable energy sources biomass and biogas are sustainable, but the role of coal energy will also increase. In the short term, the authors predict that energy plantations will also play a role.

According to Greenpeace's 2010 calculation, by 2050 97 per cent of European energy supply and 92 per cent of the entire energy consumption could be secured through renewable energy resources, even at the current level of technological development available for wind power plants, solar panels and other technological instruments.

It is therefore Hungary's responsibility to ensure that this opportunity is realised, that it drastically reduces energy consumption and increases the ratio of green energy by 2020, and that by 2050 it can secure its energy supply by relying on its own renewable energy, independent of other countries.

## 6.2 Adaptation

Since Hungary will be especially affected by climate change, it has several specific responsibilities that will help it promote adaptation. The VAHAVA report[108] is the primary source discussing the possibilities of adaptation (see Section 3.2). The report touches on anticipated floods, inland waters, droughts and managing damage resulting from torrential downpours. It also addresses what needs to be done, including responsibilities in environmental protection, transportation, food supply, water management and environmental health. The report stresses that the general public, municipalities, enterprises and agricultural producers all need to be adequately prepared for the anticipated impact of global warning.

The adaptation strategy encapsulated in the National Climate Change Strategy (NÉS) adopted in 2007 sets out two objectives:

1. Prepare the domestic economy and society for what will in all probability be hotter and drier seasons.

2. Establish rapid reaction–type technical, financial and organisational conditions that are suitable for pre-empting or managing the damage inflicted by unexpected extreme weather events.

Several political parties and experts have also recom-

108. http://www.vahavahalozat.hu/

mended that domestic agriculture must be transformed to adapt to changing circumstances, for example through the spread of drought-resistant species. Hungary is most at risk in Europe with regard to declining precipitation, which implies that specific measures must be taken beyond water management strategies. These measures should promote water conservation and rainwater retention. To remedy the increasing frequency of floods, Hungarian scientists endorse the implementation of the New Vásárhelyi Plan (Új Vásárhelyi-terv).

Adapting to heat is a pre-eminent responsibility for cities and towns; urban areas must be prepared for heat waves. The ratio of wooded areas and parks must be increased, and water retention must be ensured in the urban areas. In certain extreme conditions adequately cooled facilities must be provided for people susceptible to heat, especially the elderly. Urban areas and their sewage systems must also be prepared to drain water from intense downpours.

A Hungarian scientist has formulated recommendations[109] aimed at moderating the harmful effects of climate change on biodiversity, broken down by sectors. In order to protect indigenous species, he has determined tasks and responsibilities in environmental protection, water management, forestry, agriculture and also transportation.

It is in Hungary's fundamental interest to begin promptly to implement the tasks set out in the various research projects, and primarily the VAHAVA report, which could help mitigate the adverse effects of climate change. If we delay these measures further, we will not able to preempt the massive damage that will likely occur later.

## 6.3 Promoting the Green Economy

According to a 2011 Eurobarometer survey,[110] 73 per cent of Hungarians believe that combating climate change and increasing energy efficiency would give the EU economy a boost; 92 per cent of Cypriots and Swedes share this notion, while only 66 per cent of Lithuanians agree. In Hungary, 19 per cent believe that combating climate change will certainly not help the economy. In European comparison, this minority is comparatively substantial: the ratio of sceptics is the fourth highest in the EU.

Experts suggest that Hungary still has significant emission reduction reserves, by way of energy conservation, improving energy efficiency and the use of renewable energy. The Working Group Air argues[111] that numerous environmentally harmful sectors continue to receive concealed state aid. It would take a substantial transformation in the structure of the economy, therefore, to ensure that domestic production is truly transformed along the lines of climate protection considerations. This would also yield specific economic benefits: reducing per unit energy consumption would improve productivity, enhance the security of energy supplies and decrease Hungary's dependence on energy imports. Practically all political forces in Hungary endorse developing the green economy, in line with the realistically attainable possibilities. Promoting the green economy and green job creation also figured in FIDESZ's election manifesto; MSZP emphasises the importance of a Green New Deal and a green transformation; Jobbik is committed to climate protection; and LMP, which is a green party anyway, has even worked out detailed proposals in its budget plan entitled Jobs, air!

## 6.4 Research and Development

Both the EU's FP7 and LIFE+ programmes, and to a lesser degree the National Scientific Research Fund programme in Hungary, support research on climate change and renewable energy. The possibilities for using renewable energy more efficiently is probably addressed most efficiently by the industry with a vested interest in this issue. In Hungary, the Western Hungarian University (Nyugat-Magyarországi Egyetem) is home to an international climate research centre that has been operating since 2009.

Retaining the existing research in Hungary, potentially even increasing it, is very important. It is also crucial that

109. Bálint Czúcz: Az éghajlatváltozás hazai természetközeli élőhelyekre gyakorolt hatásainak modellezése [Modelling the impact of climate change on domestic semi-natural habitats], Doctoral (PhD) dissertation, Budapest, 2010. Available at: http://phd.lib.uni-corvinus.hu/523/1/czucz_balint.pdf

110. See: http://ec.europa.eu/public_opinion/archives/ebs/ebs_372_en.pdf

111. See: http://levego.hu/tevekenysegeink/allamhaztartasi_reform, http://www.mr1-kossuth.hu/hirek/tudomany-110910/varosi-klima.html

domestic universities and research institutions can effectively apply for EU funds. International experience shows that the results of research projects are more effectively communicated to the public and decision-makers by civic organisations that cooperate with the institutions conducting the research. It would be essential to research the border areas of climate science, and hence research on sectoral adaptation and on the relationship between climate change and other pollution (for example, air pollution, chemical pollution) would also be called for. Domestic civic organisations have repeatedly called attention[112] to the need for urban climate research, since urban residents – and therefore the majority of the population – will likely be more afflicted by the consequences of climate change, given that in urban heat islands it may be up to 6–8 degrees Celsius warmer than in the areas near or around the city.

Research results should be incorporated in decision-making as quickly as possible. Political decisions often rely on research results that are several years old and fail to take into account ongoing changes. An example illustrating this is that numerous scholars and economists have shown the environmentally harmful impact of biofuels, and still their introduction has been mandated at the EU level, while in Hungary the sustainability criteria of bio-energies is questioned by many.[113]

## 6.5 Promoting Climate Consciousness – Civic Programmes

Promoting the spread of climate conscious behaviour may be achieved by complementing economic incentives and legal provisions with education and the presentation of good practices. Environmental education still needs to be strengthened significantly in Hungary, and campaigns geared towards promoting non-genuine forms of sustainability that serve partial interests should be pre-empted.

In 2010 and 2011, the tenders issued in the framework of the New Széchenyi Plan's (Új Széchenyi Terv) Environment and Energy Operational Programme – which continued the system established by the New Hungary Development Plan (ÚMFT) – supported campaigns and model projects that »promote sustainable lifestyles and consumption possibilities«. It was not possible to apply for the greater portion of Environment and Energy Operational Programme tenders, which used to be open to civic organisations, in autumn 2011 and no decisions have been made yet about the tenders offered at the beginning of the year.

Financial support for green organisations has significantly narrowed in recent years. Hence it would be crucial to provide more active support to the civic sector. Yet in reality support systems for civic organisations in general, such as National Civic Fund, and support for environmental activities in particular, have both been scaled back substantially. According to a joint statement by domestic green organisations, »even though based on its election manifesto FIDESZ-KDNP pledged to strengthen civic organisations, the operational conditions of the sector have continuously and substantially deteriorated in the past year and a half«.[114]

112. See: http://www.levego.hu/hirek/2011/07/varosklima_budapest_a_szeszelyes_varos

113. See: www.mtvsz.hu/dynamic/biomassza-dilemma2.pdf

114. See: http://levego.hu/hirek/2011/11/osszeomlas_szelen_a_hazai_civil_szektor

## Summary

Hungary is more vulnerable to climate change than most countries in Europe and in a number of areas. To take only one example, the annual increase of average temperature is one and a half times the global average. Nevertheless, Hungarians profess to be less afraid of climate change than the average EU citizen. Climate change affects ecosystems, forests, agriculture, water management and human health.

The environmental effects of temperature change cause ecological damage and significantly influence the existence of different species. The best illustration of this is the decrease in biodiversity. Greenhouse gases are responsible not only for climate change, but also for air pollution, which causes serious health problems and is connected to the early death of 16,000 people per year in Hungary. The negative effects of climate change can also be measured by the decrease in agricultural production and - according to the most pessimistic estimations – a fall in GDP of approximately 20 per cent over the long term.

According to Policy Solutions, domestic climate change policy can be improved in many ways. The objects and purposes of the Hungarian Government's National Climate Change Strategy (NÉS) include reducing the consumption of fossil fuels, curbing the current level of energy consumption, launching a civic initiative for energy efficiency, increasing the share of renewable energy sources and developing public transport. Besides renewable sources, nuclear power is also part of the equation.

Since Hungary is exceptionally affected by the damaging consequences of climate change, adaptation must be moved forward, using many tools simultaneously. The domestic economy and society must be prepared for periods of drought. Furthermore, responsive technical, financial and organisational conditions must be created that are capable of preventing and managing damage caused by unexpected weather conditions.

There is a great need to stimulate a »green economy« and reshape the economic structure, so that domestic production can be altered in accordance with climate protection considerations. Increasing financial support for research projects on climate change is important, as are applications from universities and research institutes for European funding. Finally, raising climate awareness with educational and training programmes is desirable, along with enhanced support for green NGOs.


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