

**Expected economic effects of the climatic change in
Hungary, 2020-2040**

Summary in English

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The Institute for Economic and Enterprise Research operated by the Hungarian Chamber of Commerce and Industry (IEER or GVI in Hungarian) is a non-profit economic research institute indulging in applied research in several subfields of economics. Our mission is to provide empirically and theoretically substantiated knowledge and analysis of the economic and social processes that influence the actual situation and perspectives of Hungarian economy and Hungarian companies.

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The brief analysis of the Institute for Economic and Enterprise Research (IEER) investigates the diverse economic impacts of climate change, and besides that it also focuses on the description of the expectable effects on the Hungarian economy.

Human activities like greenhouse gas emission are a major cause of climate change. In order to reduce the negative effects of climate change there are two general types of strategies: one of them attempts to reduce the extent of climate change (mitigation strategies) the other tries to find ways to adapt to the new conditions (adaptation strategies).

Social and economic impacts of climate change can be examined by using dynamic mathematical and statistical models of multiple interdependent factors.

Efforts to reduce global warming can be considered as a public good and there is a related free rider problem. Everyone benefits from the results of these efforts and non-payers (free riders) cannot be excluded. This results in a sub-optimal level of innovations, R+D expenditures and investments related to greenhouse gas reduction.

The harm caused by greenhouse gases (GHG) can be considered both as spatial and as dynamic externality. Consequently countries less willing to make efforts to reduce GHG emission impose a negative effect on other countries (spatial externality). The actions of the current generation impose an externality on the next generation welfare (dynamic externality).

The primary effect of climate change is the rise of average temperature. In Hungary average temperature is expected to increase 0.5-3 degrees Celsius until 2050. The number of frigid days will decrease by 12-15 days annually in contrast the number of days with a heat alert may increase by even 14 days compared to the second half of the 20th century.

As a result of increased temperature typical precipitation forms, frequencies and amounts are also going to change. In Hungary less frequent but more intense precipitation can be expected mostly in winter, which is becoming the wettest season.

Heavy rainfalls can result in soil erosion in the basin of Central-European rivers and in extreme cases changes in topography may also occur. From the same reason more severe floods can be expected. On the other hand drought hazard is also expected to become a serious problem in Hungary. Small lakes in the Great Plain may dry up completely and Lake Balaton may lose significant portion of the water it receives naturally.

Agriculture is one of the most vulnerable sectors to climate change in the economy. In Hungary the appropriate selection of cultivated species and other adaptation actions (e.g. installation of irrigation systems) may turn the effects of climate change to favourable.

The decreasing energy demand of the Hungarian industrial sector can increase the competitiveness of Hungary in the medium - and long term. Due to the climate change it is likely that industries like manufacturing of air-conditioning systems, heat insulators, solar panels and other industries related to alternative energy sources will represent a greater proportion of the GDP.

In the upcoming decades conversion to renewable energy sources will define the main trends in the energy industry. On the consumption side, it mostly affects heating and transportation, and on the supply side, a large development of solar and wind energy use is expected. In Hungary the existing capacity of wind generators will increase and due to the increase of solar irradiance and the decreasing costs of solar power production a rapid advancement of solar power use is expected.

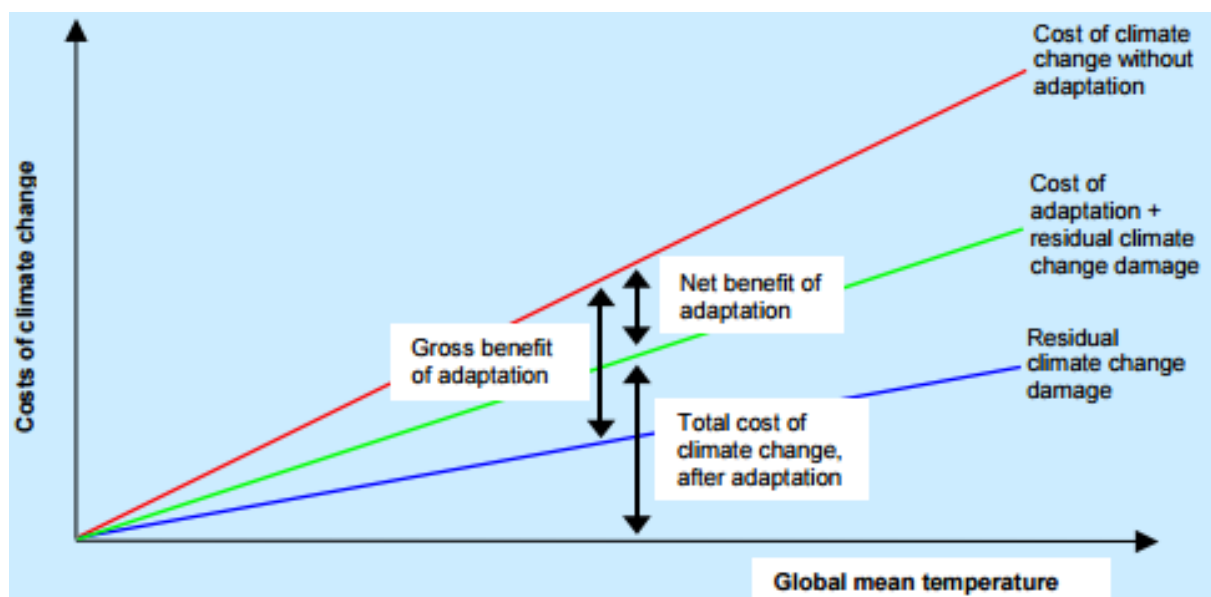
Climate change may speed up the depreciation of buildings and canal systems. Air-conditioning of buildings is not sustainable in the long term, however, heat insulators and insulated doors and windows can be a cost efficient and energy saving option. The test of green roofs is currently in progress.

In the services sector the insurance services are the most affected ones by climate change, since they will have a key role in the management of the emerging risks. The decreasing amount and quality of natural freshwater will impose a negative effect on the tourism sector, however, it will be counterbalanced by the advancement of water tourism and the longer summer vacation period.

Climate change related migration may occur due to the lack of drinkable water, desertification, increasing hazard of natural disasters or the raising sea level. Climate change caused migration may affect Hungary as well.

Health impacts of the ever more frequent heat waves will be serious even in the medium term, and the health hazard caused by floods will also be significant. As a result of climate change the population of ticks, which is responsible for most vector spread diseases, will increase in Hungary. Longer blooming period of allergen pollen producing plants and the new invasive allergen plants will be a further negative impact.

Figure 1: Role of adaptation in the reduction of climate change damage



Source: Stern, Nicholas, 2008. *The Economics of Climate Change*. *American Economic Review*, Vol. 98, No. 2 (2008), pp. 1-37.