



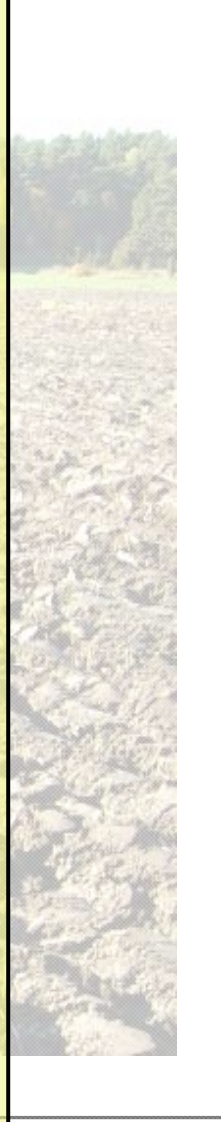
# Agrofuel and/or food production?

**Tamás Németh**

Hungarian Academy of Sciences

07<sup>th</sup> July 2009.  
Budapest

**Tamás Németh – Agrofuel and/or food production ...**





## The elementary factors of quality of life



- clear **water**;
- clean **air**;
- sufficient quality and quantity **foods**.



**Assessment of KAP assistance  
22. November – 19. December, 2004.  
(25 thousand citizens of 25 member-states)**

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**Priority:**

- 1, Rich, stable and adequate income – 36 %**
  - 2, Healthy and safety food – 30 %**
  - 3, Environment protection – 28 %**
-

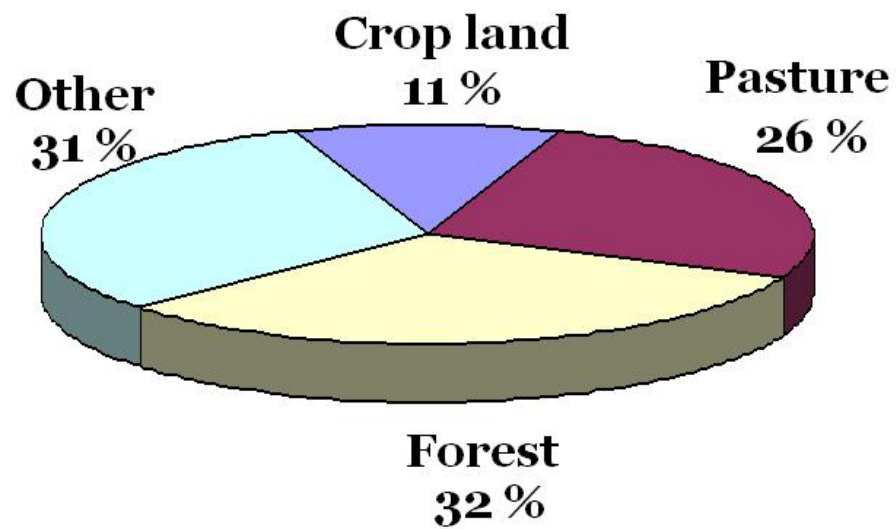


## **LÁNG (1995) emphasises the role of six elemental factors in the establishment of the sustainable development of the Hungarian agriculture**

- natural resources, since Hungary has comparative advantages compared to the most European country considering the extent of arable land and favourable – cultivation – environment per person,
  - biological potential, landscape management,
  - technical and technological environment,
    - social-economical environment
  - human factors (education, professional education)
- scientific research, higher education and consultation



## The formation of Landuse in the World





## The Changes of Cultivated Lands of the World between 1850-1980 (1850 = 100 %)

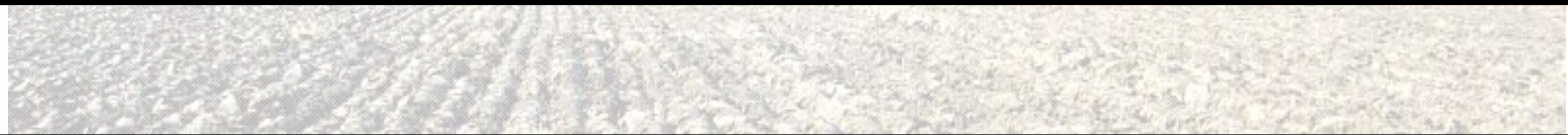


South Asia	296%
South-East Asia	770%
Europe	96%
North America	409%
China	179%
Latin America	777%
Soviet Union	247%
Tropical Africa	388%
Total	279%

IIED-WRI, 1987



**The formation of Landuse in 2050  
take into consideration the rate of annual  
changes of yield (billion ha)  
- crop land in 1990 1,5 billion ha -**



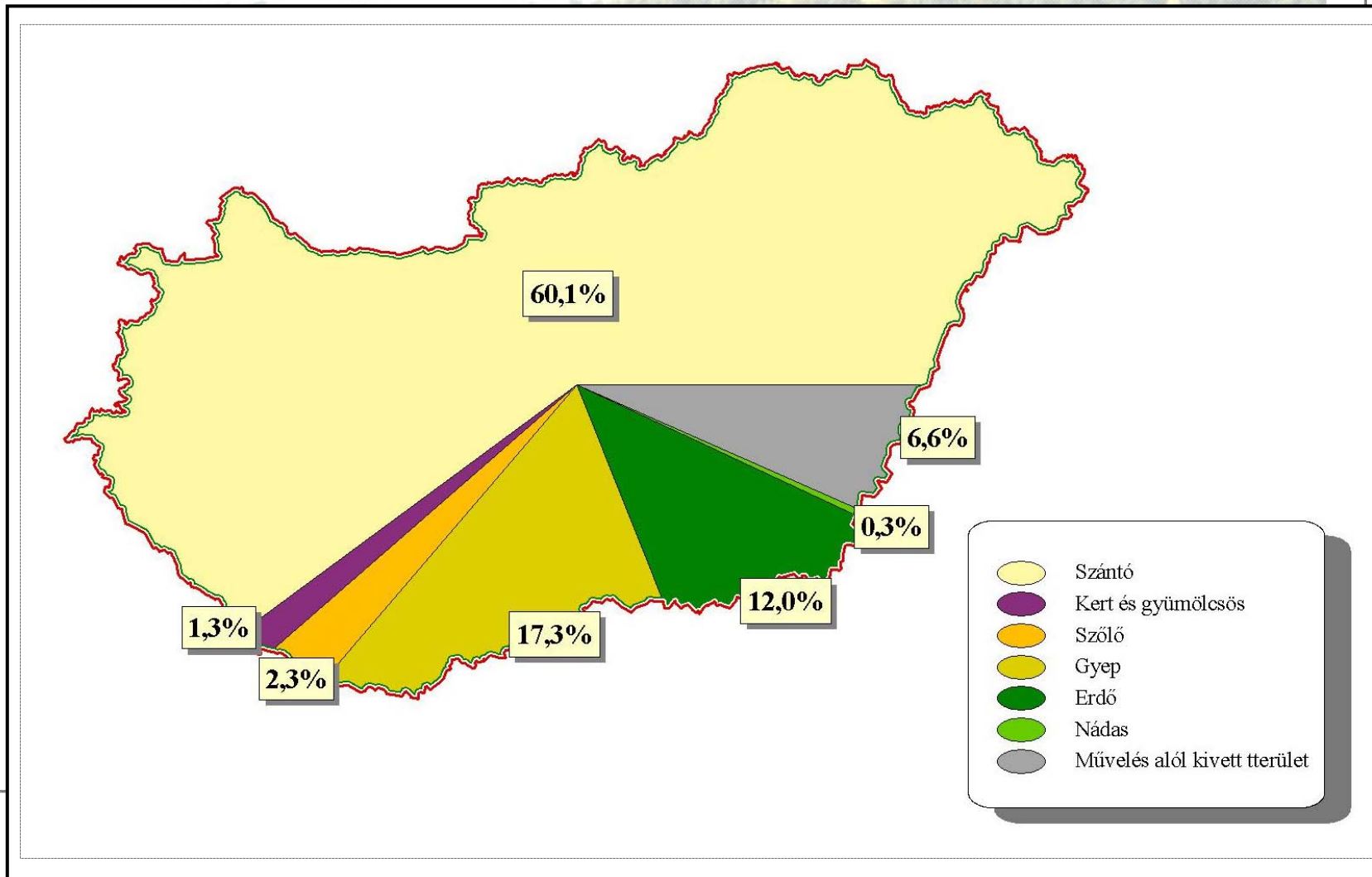
rate of annual changes of yields	crop land	pasture	forest	non cultivated
0,0%	2,83	2,07	1,13	3,42
0,5%	2,37	2,01	1,16	3,90
1,0%	2,07	1,94	1,18	4,25

Sands – Leimbach, 2003



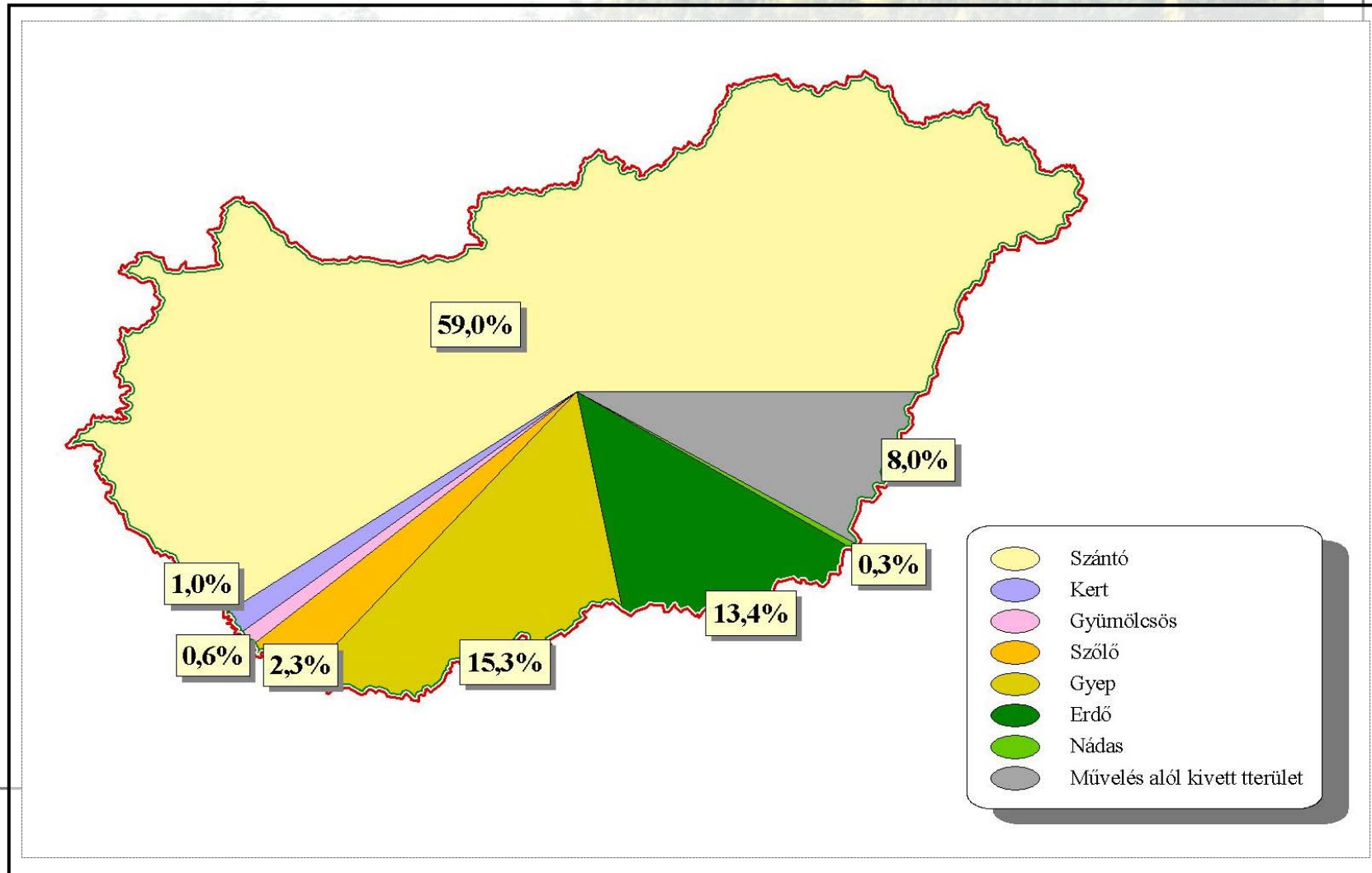


## The Landuse of Hungary between 1931 and 1950 (in average)



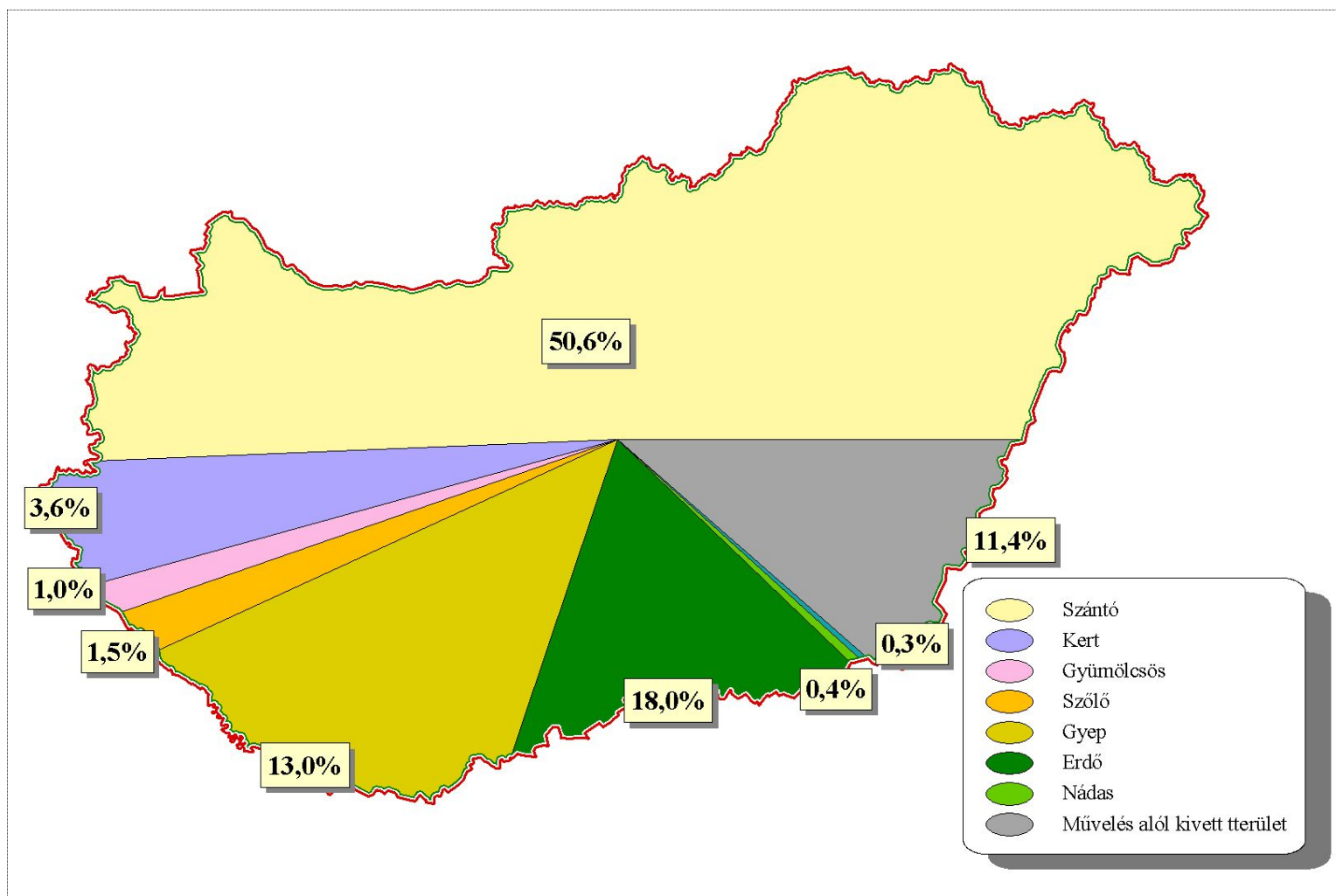


## The Landuse of Hungary in the year of 1953



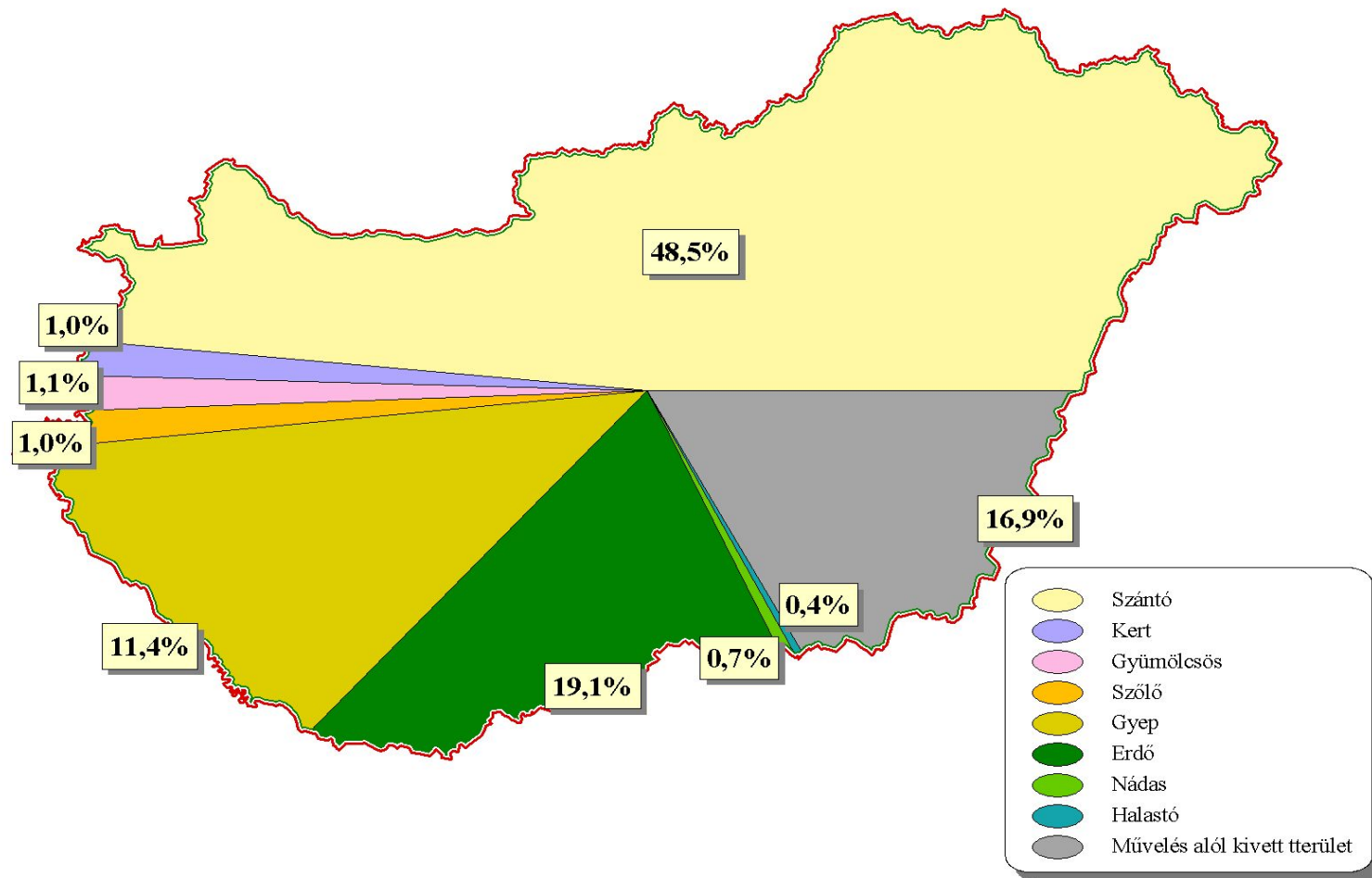


## The Landuse of Hungary in the year of 1988





## The Landuse of Hungary in the year of 2003





## Hazards

### Shrinking of arable lands

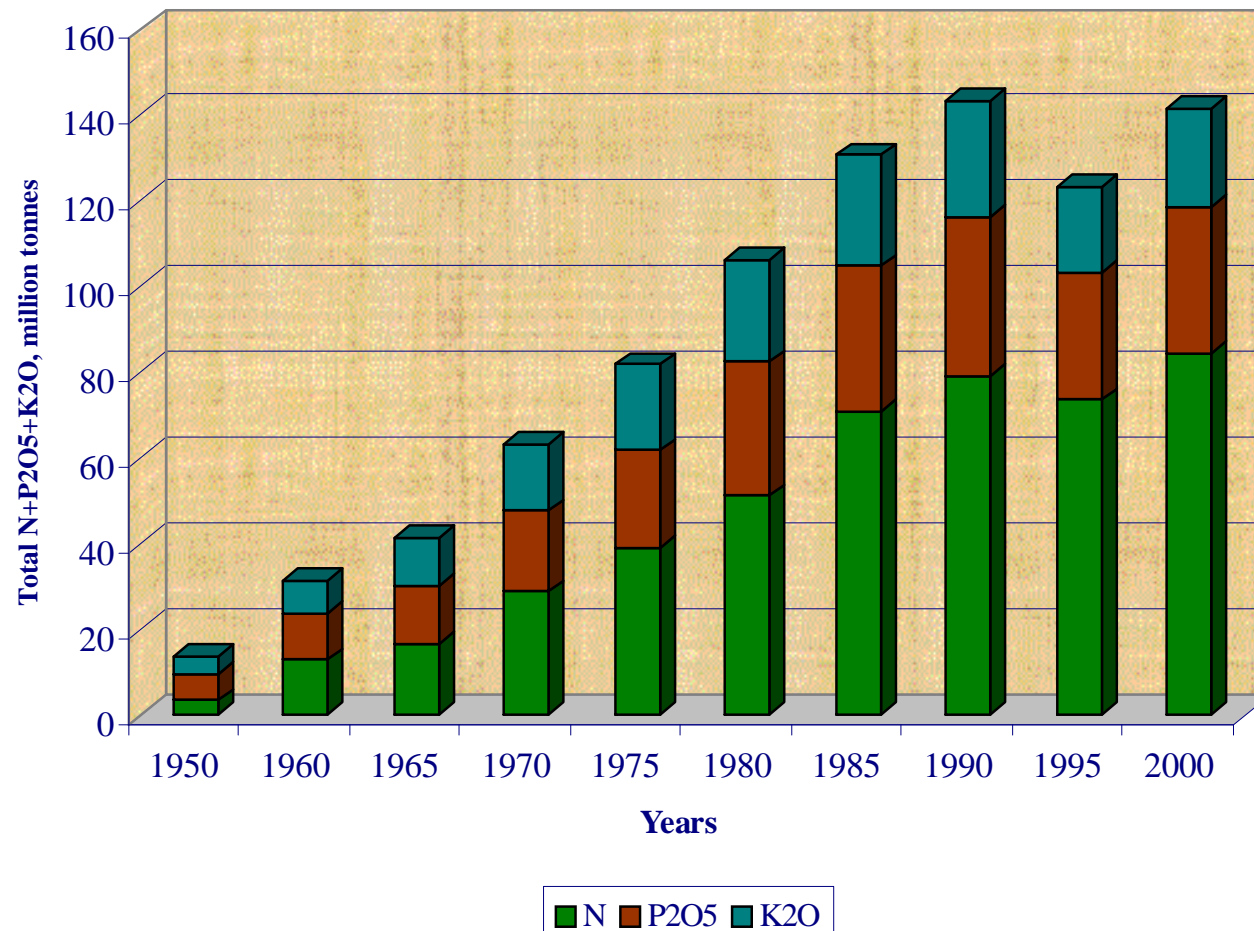
### Soil degradation

- Nitrate leaching
- Compaction
- Erosion
- Landslides
- Salinization
- Organic matter decline
- Sealing
- Acidification
- Water-logging

### Climate change

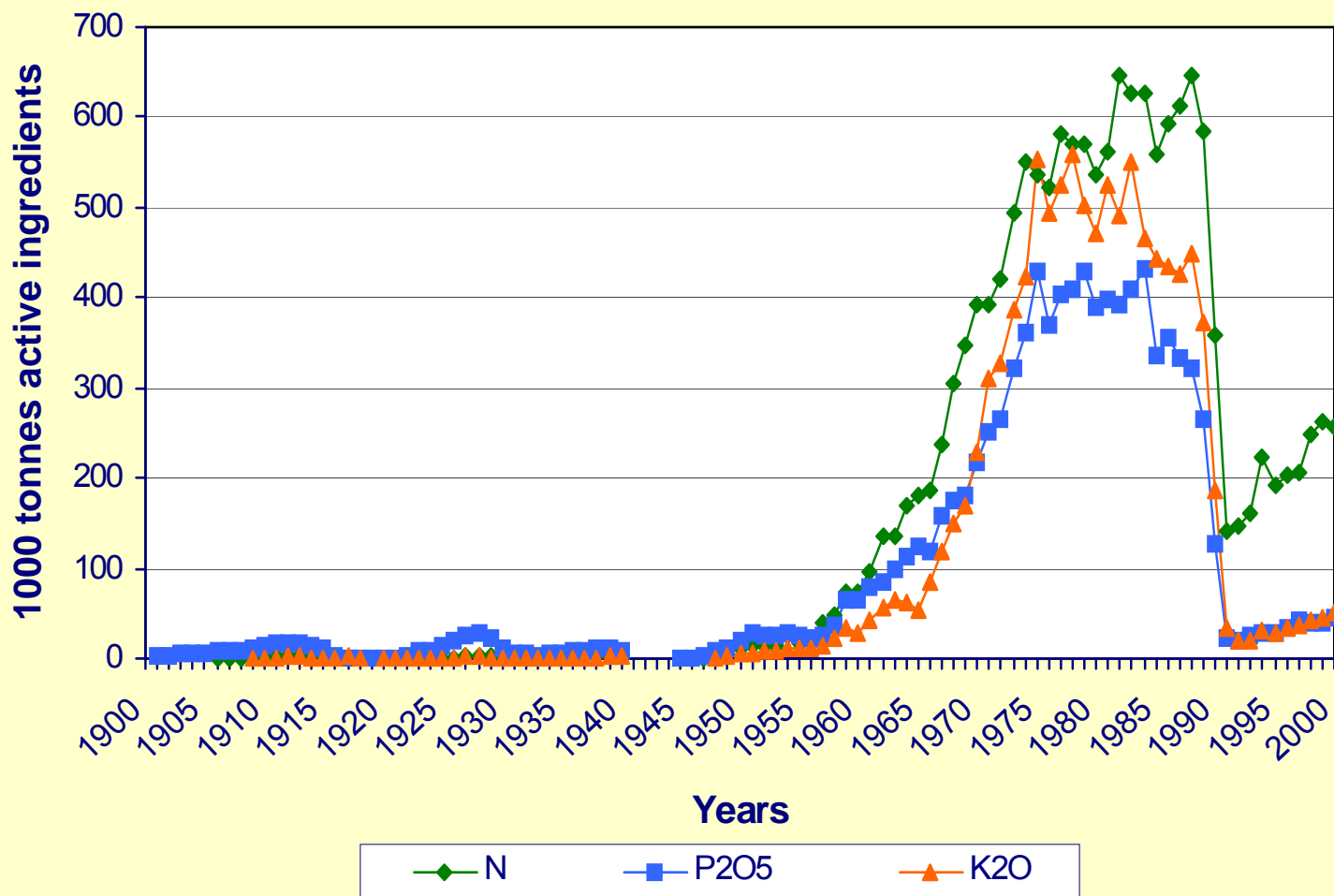


## World NPK fertilizer consumption, million tonnes of N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O, 1950-2000 (FAO Fertilizer Yearbooks)



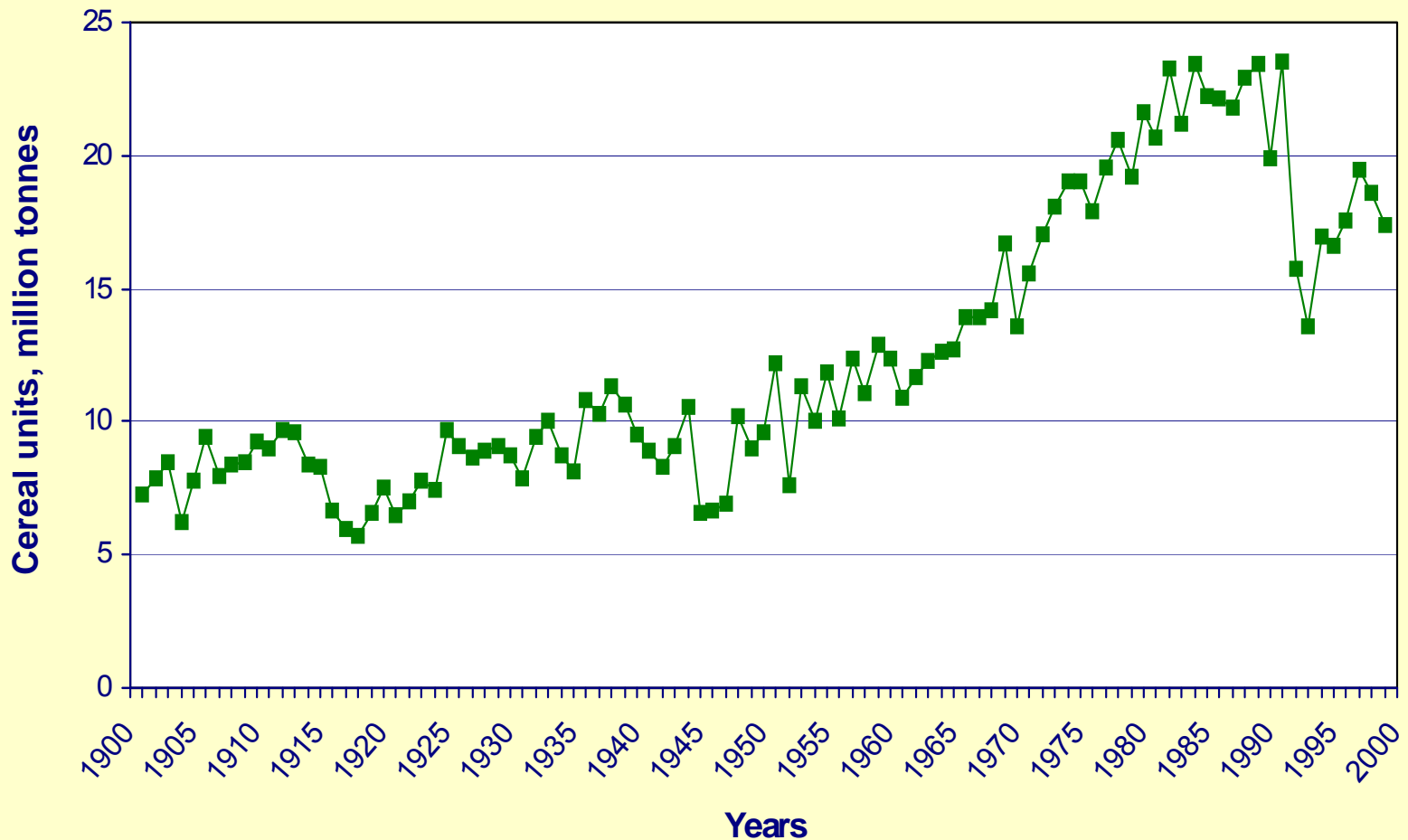


## Fertilizer consumption in Hungary 1901-2000





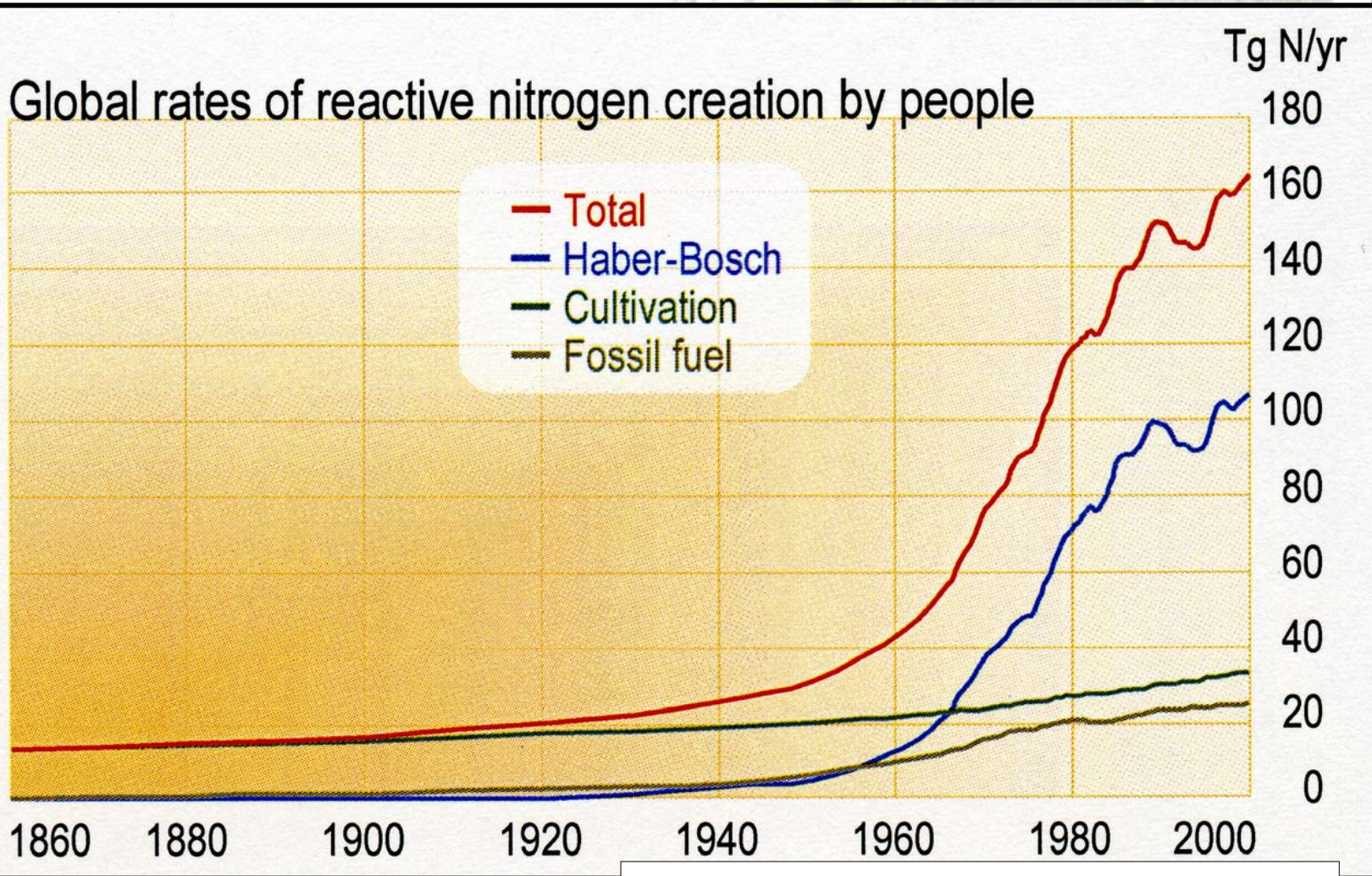
## Total production of main crops in Hungary 1901-2000







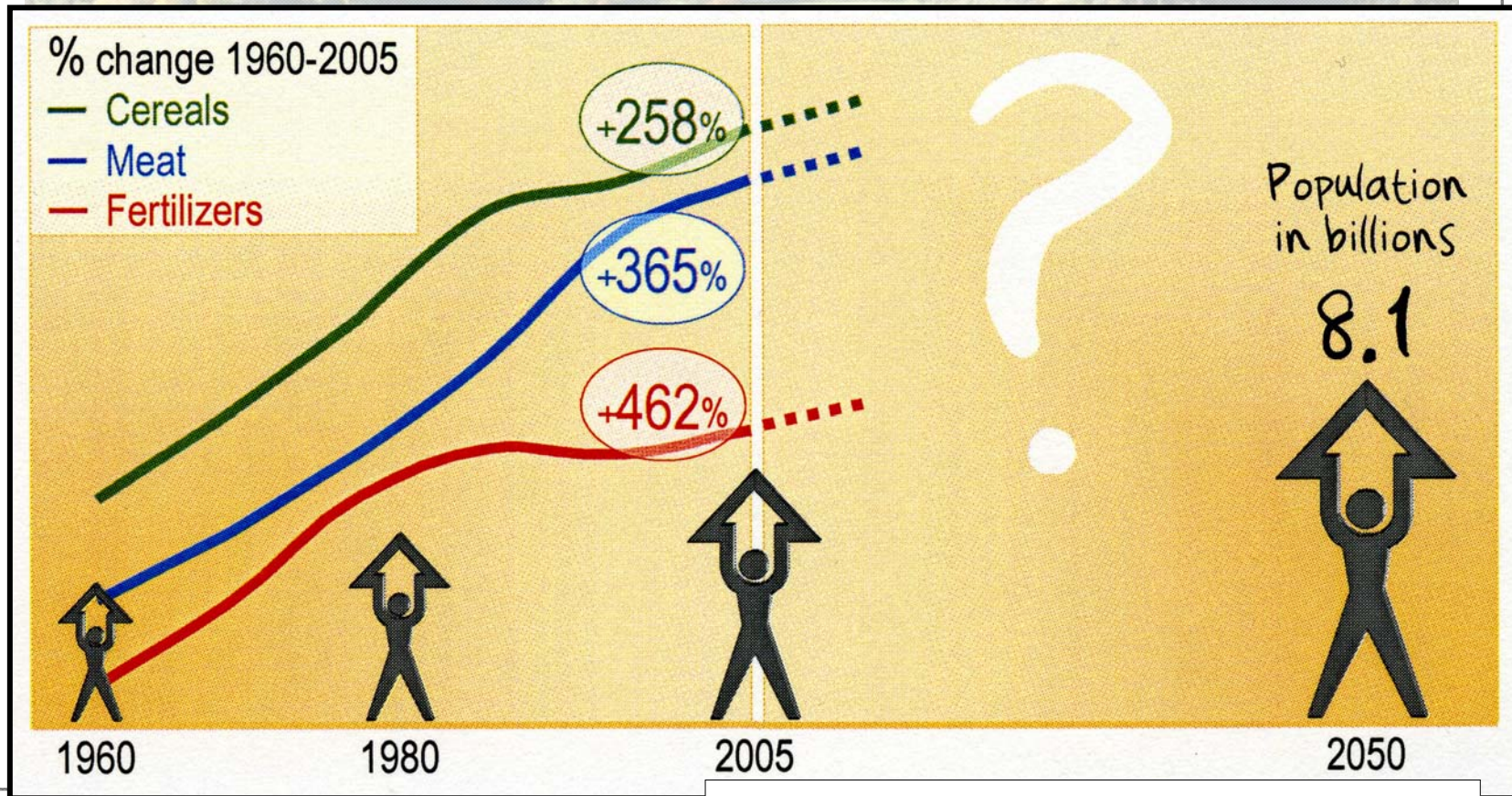
## Why Nitrogen?



L.M. Maene – IFA (Galloway et al.)



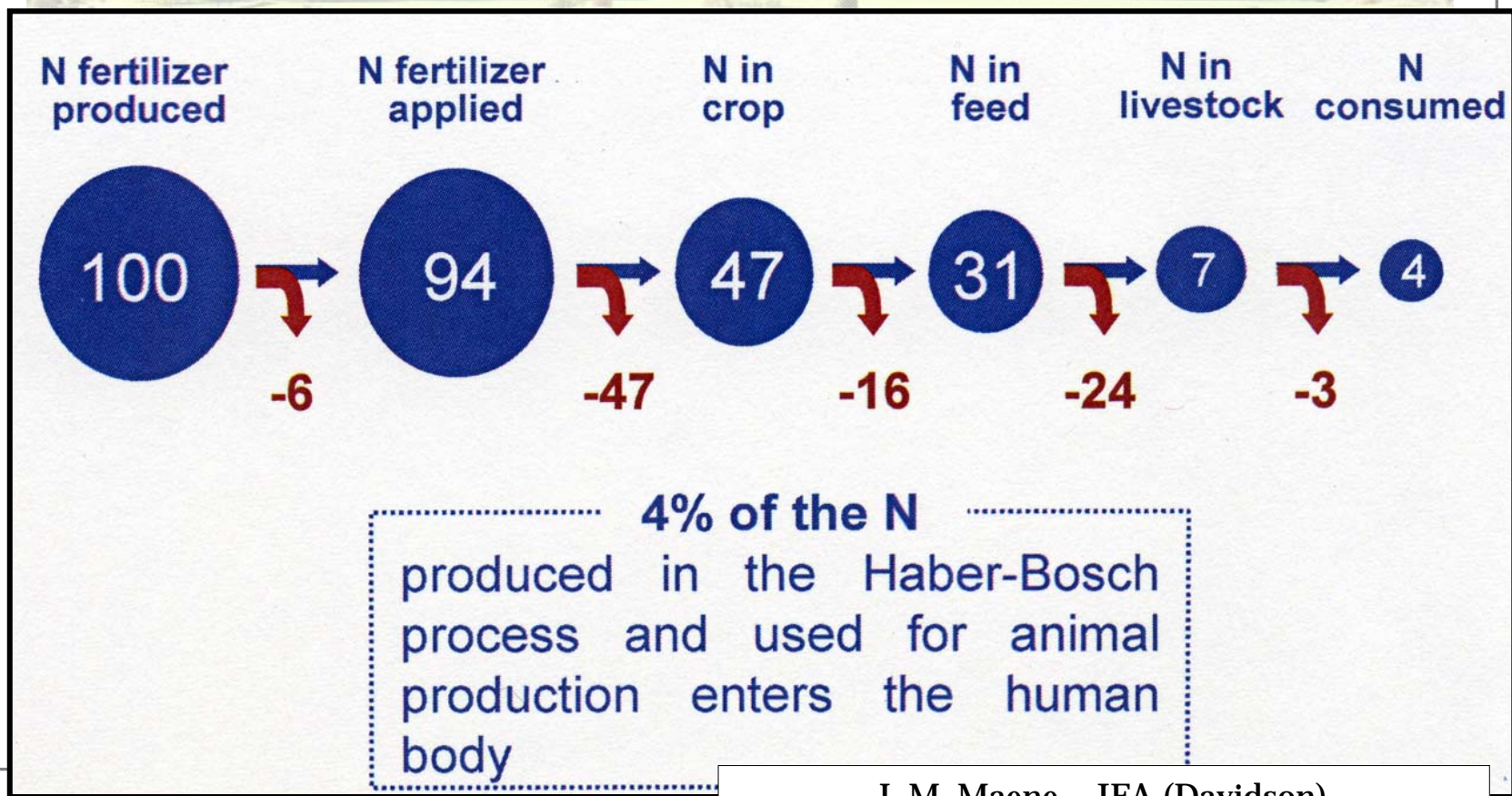
# Feeding a Growing Population



L.M. Maene – IFA (FAQ)



## The Fate of Haber-Bosch Nitrogen



L.M. Maene – IFA (Davidson)



## New EU normative: Climate protection and Energy policy

- 20 percentiles reductions of **carbon-dioxide** emission compared to the 1990 level;
- 20 percentiles increases of the **energy efficiency**;
- Raising the proportion of the **renewable energy sources** to 20 percentages;
  - Raising the proportion of **bio-fuels** to 10 percentages until 2020 in the full EU consumption of petrol and diesel.



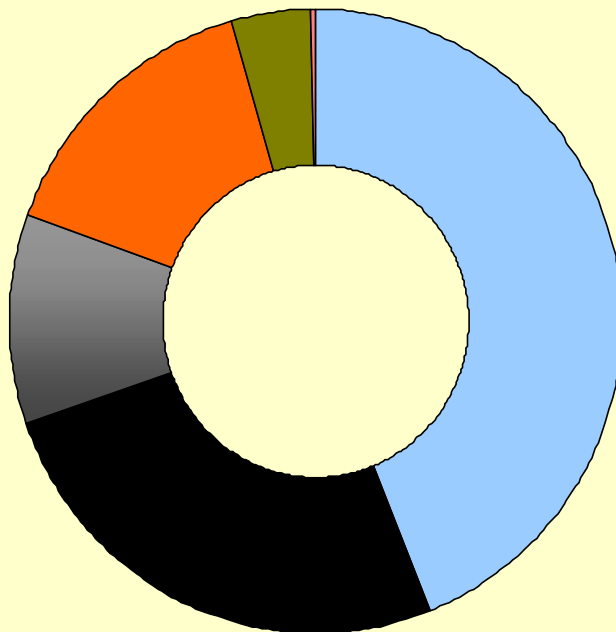
## The aim of **energetic development** in Hungary

- Cutting the harmful impacts of **climate change**
- Ensuring the assumptions of **sustainable development**
- Supporting of **environmental friendly** solutions
  - Enhancement of **safety of supplies**  
own production, EU networks, shape storage-systems
  - Achievement of **convergence-program**
    - **Thrift, competitiveness**
      - **Social liability**  
guarantee the free gateway to energy



# The structure of **primary energy supplies** in Hungary

2005



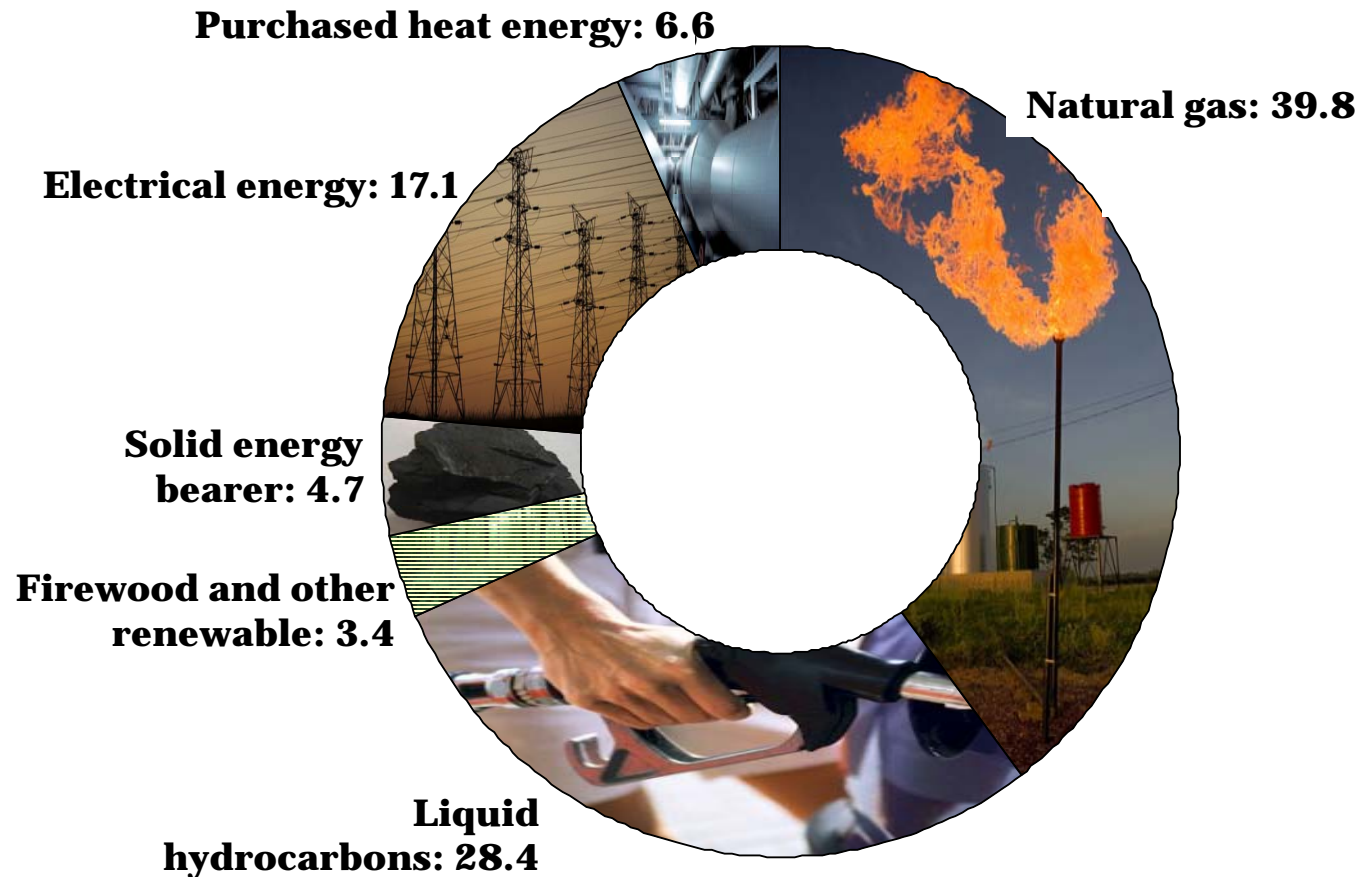
<b>Gas</b>	<b>43,9 %</b>
<b>Oil</b>	25,7 %
<b>Coal</b>	10,9 %
<b>Electrical energy*</b>	15,1 %
<b>Renewable+waste</b>	4,1 %
<b>Else**</b>	0,3 %

\* Nuclear power plant, hydraulic power plant, electrical energy

\*\* Briquettes, coke

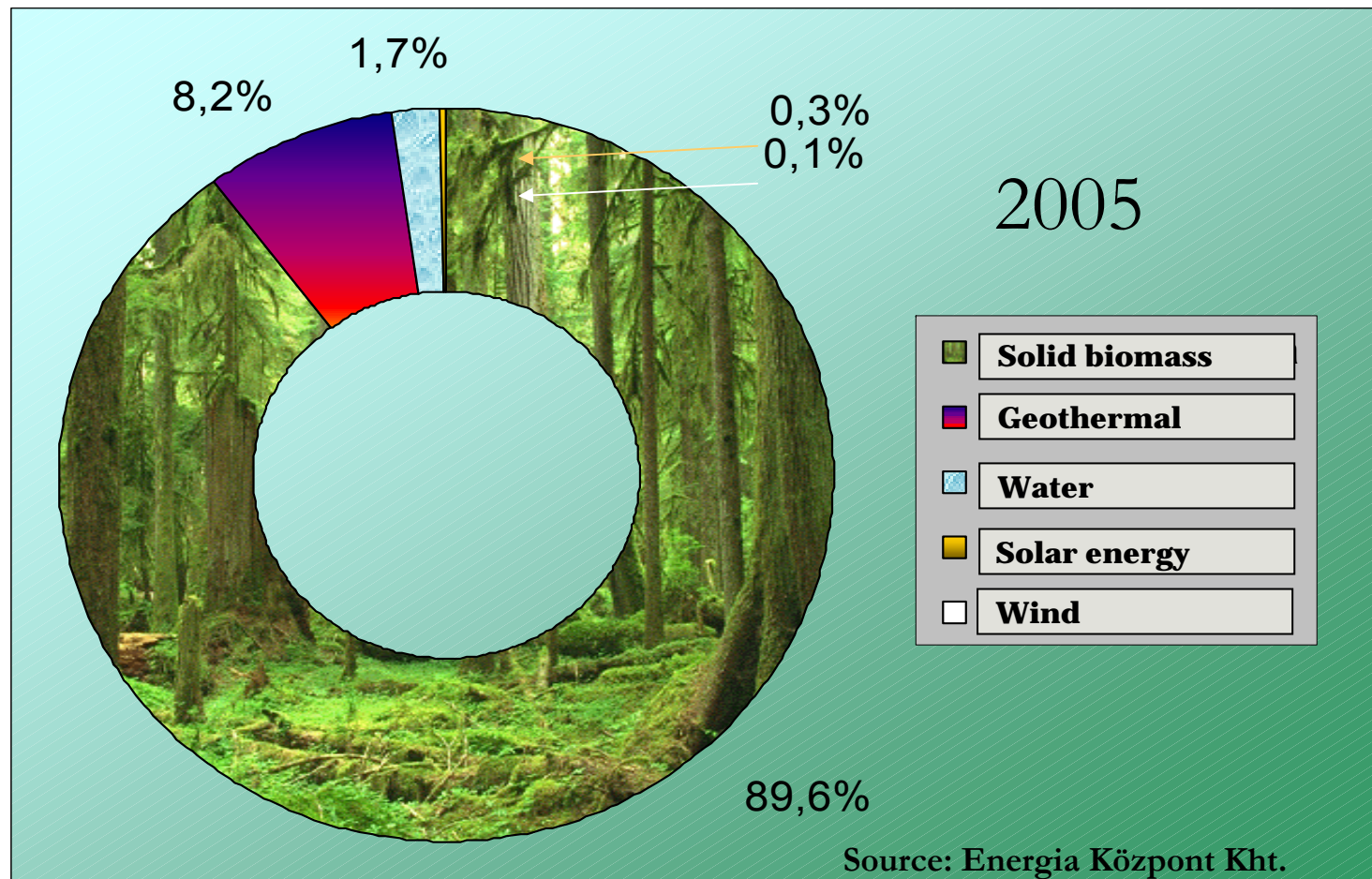


# Distribution of direct energy utilizations in Hungary (2005)

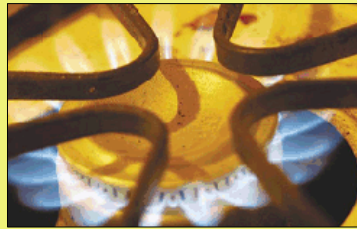




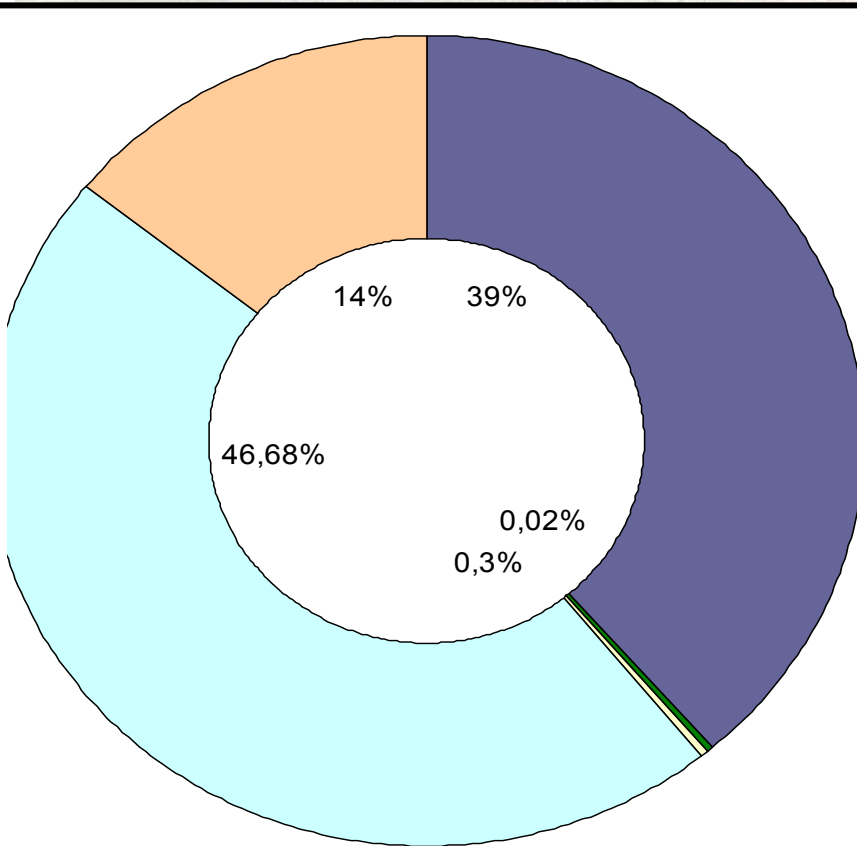
# Renewable energy sources in Hungary







# Utilization of purchased heat energy (2005)



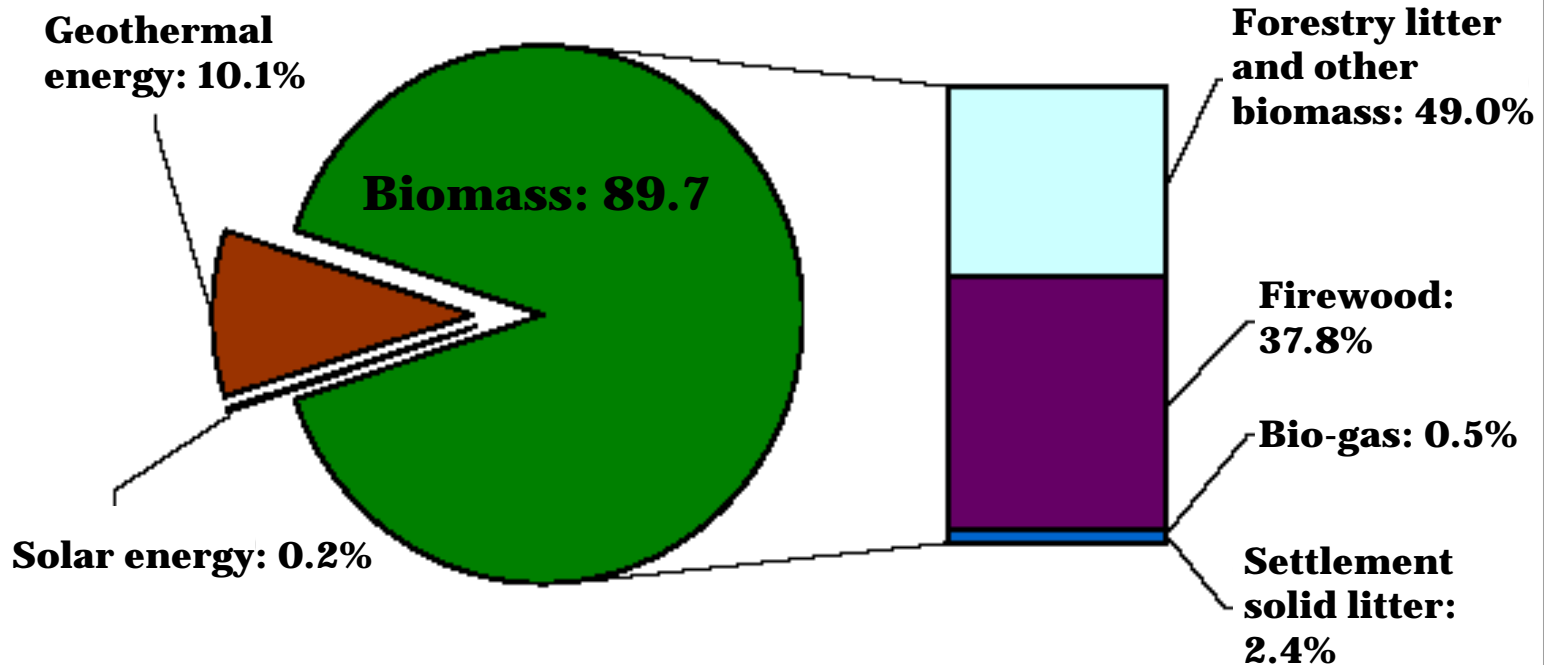
Utilization	TJ
Industry	24461
Agriculture	10
Transport, storage	196
People	29440
Communal and other consumer	9031
<b>Total</b>	<b>63138</b>

Source: Energia központ Kht.



# Renewable energy sources in the heat production

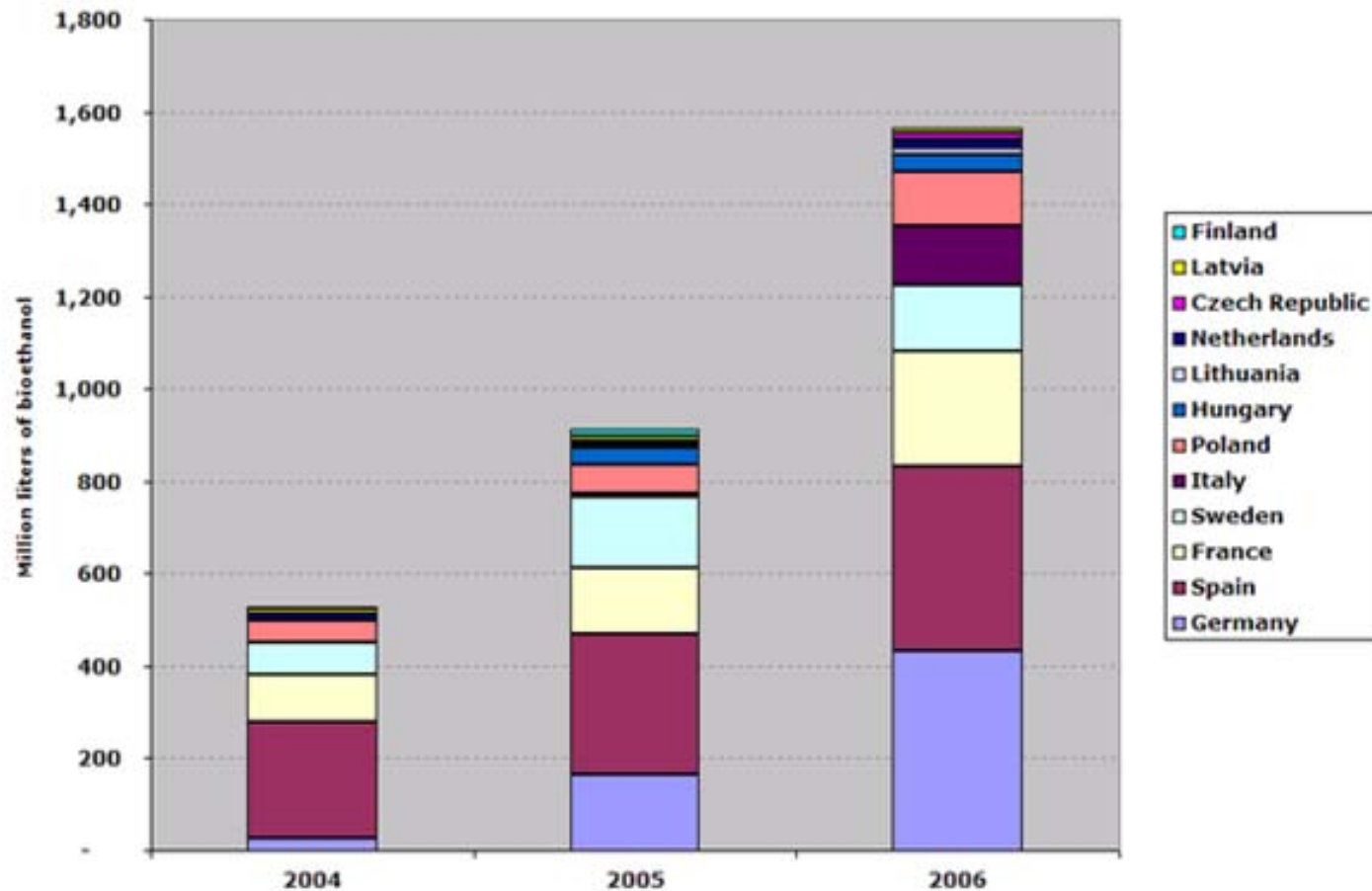
## HUNGARY (35,7 PJ; 2006)



Source: Energia Központ Kht.



# Bio-ethanol production in Europe, 2004 – 2006





# Bio-energy

## urgent resolved potential conflict of interests

There are several problems in the bio-energy production and environmental protection, sustainable development in poor rural areas, food and health issues of the agricultural raw materials suppliers around the country on economic development issues, which is very urgent to be discussed - according to the published report of Global Bioenergy Partnership (GBEP) on the 20<sup>th</sup> Energy World Conference (Rome), on November 13.

The aim of GBEP that the promises of G8 and other 5 countries (South Africa, Brazil, China, India and Mexico) will be realised in the Gleneagles Action Plan (2005) framework. The bioenergy should be covered the 20% of world energy needs, until 2060 up to 30-40%. According to International Energy Agency (AIE) there is real possibilities to cover the 7% of liquid petrol needs by bio-diesel and bio-ethanol. By that time the consumption will be quadrupled, which means annual 36 million tonnes, facing the 8 million tonnes in nowadays. In this time the petrol dominate in the transport, which means 94% market quota, in front of the 1% of bio-petrol and the 5% of electrical and coal.

**Source:** *AGRA Presse Hebdo, 19. November 2007. N° 3128; page 45.*



## Maize

„... hardly feasible ...”

*„For example the bio-ethanol made from maize can reduce the CO<sub>2</sub> emissions up to 13%.” – explains Carrado Clini, the president of GBEP, the head of Italian environmental ministry. „But this is not so good way to do it, if we take into consideration the shrinking of arable lands, the quantity of water consumption, the quantity of emitted nitrate, or rather this solution could be competitive if the cost of oil pass the 80USD per barrel.”*

*At the same time „the bio-ethanol made from cane sugar can reduce the CO<sub>2</sub> emission approximately up to 90%, and it can be competitive, even if the oil cost is 30USD per barrel.” – said M. Clini.*

The National Office of Energy suggests, that the bio-fuel could be imported from such regions, where the production is the most profitable and developed – like South-America, or rather such there could investigate into the second generation fuel researches, where could use non food raw materials, like as cellulose and algae.

**Source:** AGRA Presse Hebdo, 19. November 2007. N° 3128; page 45.



repetition, etc.: a  
learn·ing (lûr'ning)  
ear·y (lir'ë) See L  
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ng. [Appar, var. o  
ase² (lës) n. I. A  
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**Thank you for  
your attention!**