Climate literacy for upper primary teachers

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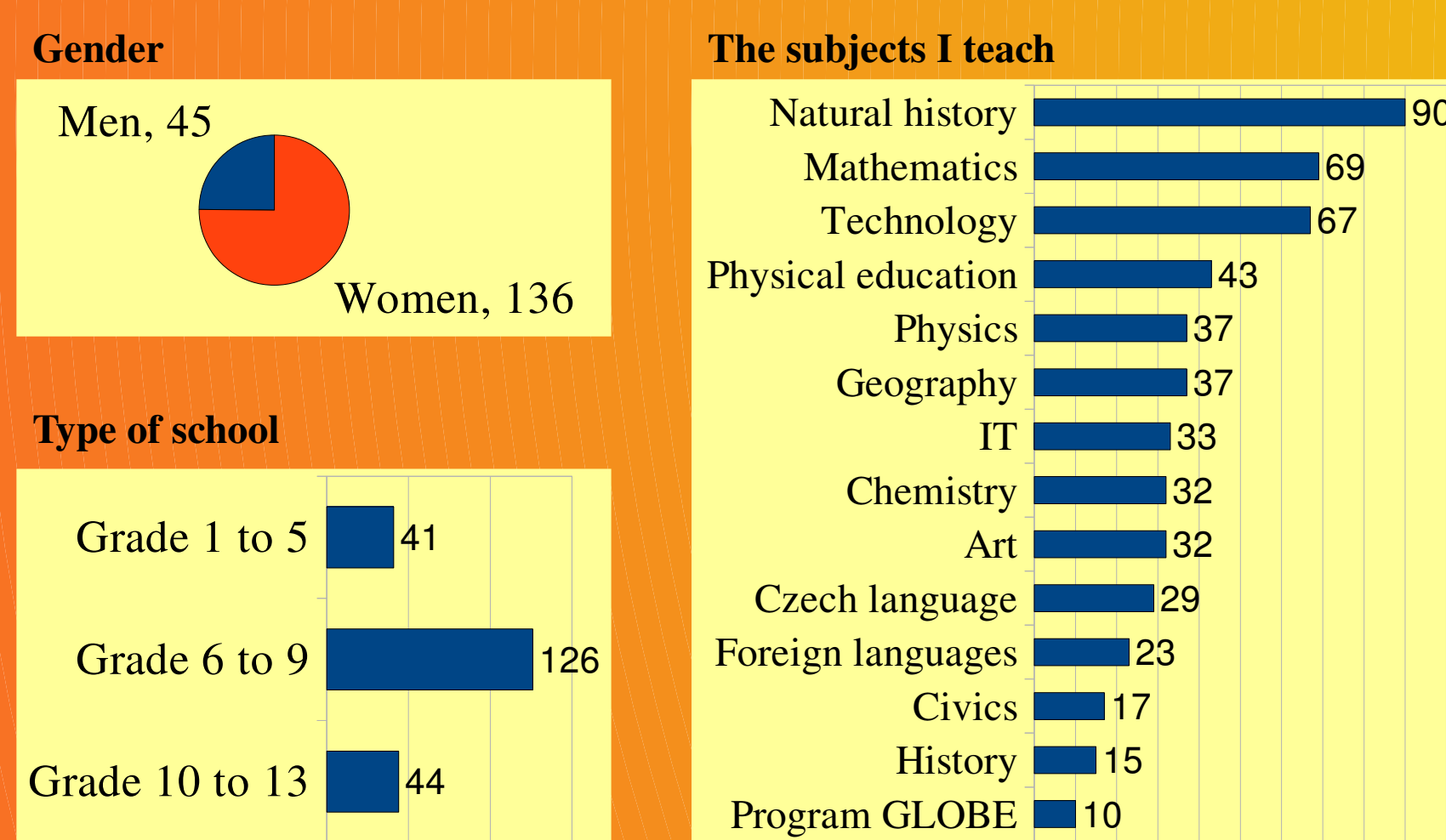
Introduction:

The topic of climate change appears frequently in the media but the scientific information is often misinterpreted by journalists and misunderstood by the public. Wide-spread denial of anthropogenic climate change competes with the data reported by climate scientists. Peer-reviewed articles are written in a scientific language which is not easy to understand. Our project seeks to develop a climate education course which could be adopted by the current educational system in the Czech Republic. In order to educate the future generations - 136 of climate sciences we need climate literate teachers. First of all we need programs to educate future teachers at faculties of education. Implementation of climate education at faculties of education requires close collaboration with the departments of Geography, Physics, Biology and others. These departments could provide courses for all students of pedagogy. Does their knowledge and perception of climate change differ from the public? Several surveys have been published showing critically low climate literacy of the public in Europe and USA. We conducted a survey investigating upper primary teachers' knowledge of climate change in the Czech republic. At the poster we present some results of our survey.

Methodology:

In 2010 the Yale University prepared an extensive questioner Americans' Knowledge of Climate Change, conducted a survey and published the results. We selected 30 questions used in this project which were translated to Czech language. The questioner was converted into on-line form powered by Google Docs. The link to Google Docs form was redirected from our web address <http://climateliteracy.eu> which is currently used to show the results. The request to participate in the survey was sent by E-mail to cca 300 schools. All the teachers who received the request and filled-out the form were volunteers and they were not paid.
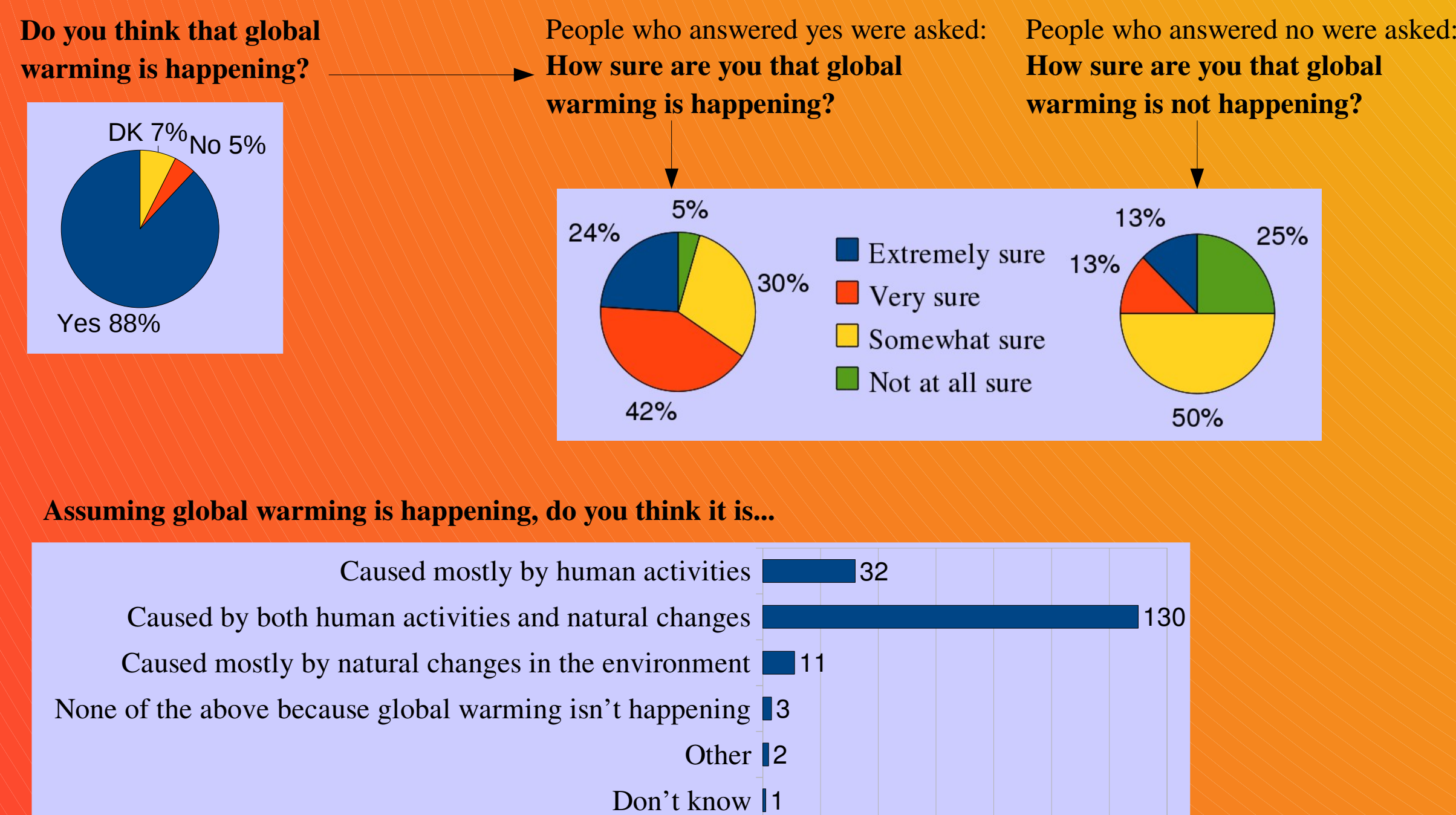
Respondents:

Total number of respondents was 181 teachers. Traditionally there is majority of female teachers in Czech public schools. This aspect was reflected in the survey - 136 women and 45 men participated. Most of respondents (126) work as upper primary teachers (grade 6 to 9) others work as lower primary (grade 1 to 5) and high school (grade 10 to 13) teachers. Some teachers work at two types of school at the same time, thus total number of answers (211) to "Type of school" question exceeds number of respondents.

Gender
Men, 45
Women, 136

The subjects I teach
Natural history 90
Mathematics 69
Technology 67
Physical education 43
Physics 37
Geography 37
IT 33
Chemistry 32
Art 32
Czech language 29
Foreign languages 23
Civics 17
History 15
Program GLOBE 10

Type of school
Grade 1 to 5 41
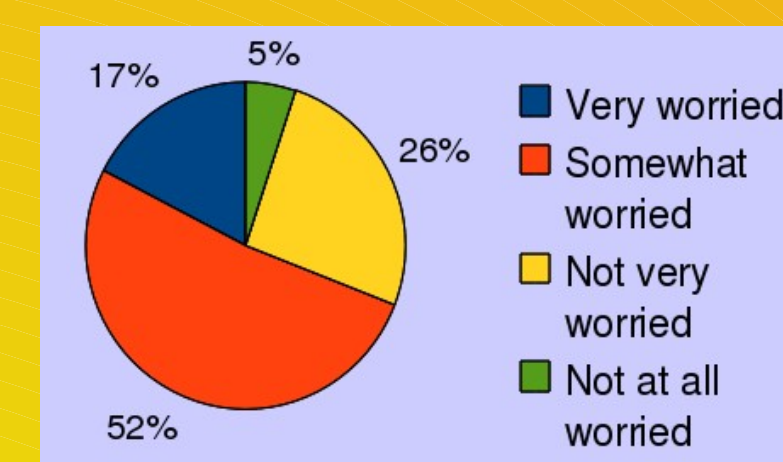Grade 6 to 9 126
Grade 10 to 13 44

Results:

Graphs presented below are divided by color to 3 categories:
1. basic information about teachers (yellow), 2. experiences and attitudes (blue), 3. knowledge (orange).
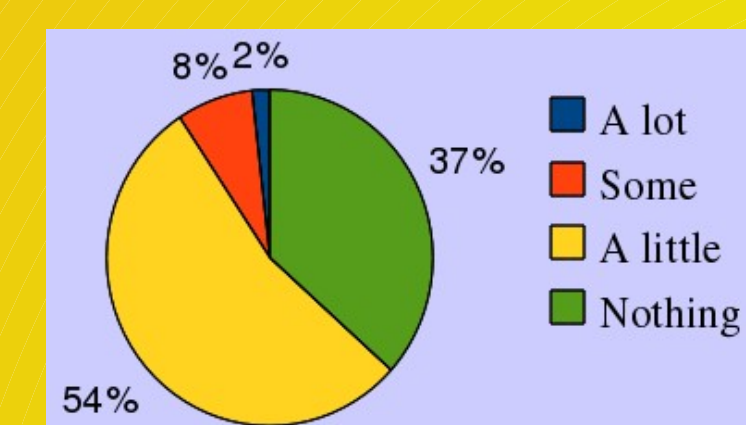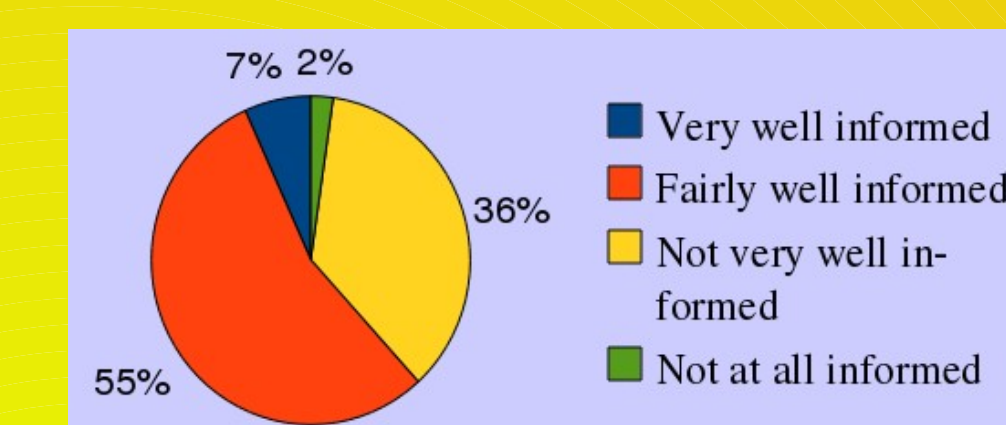
Do you think that global warming is happening?
DK 7% No 5%
Yes 88%

People who answered yes were asked: How sure are you that global warming is happening?
5%
24%
30%
42%
Extremely sure
Very sure
Somewhat sure
Not at all sure

People who answered no were asked: How sure are you that global warming is not happening?
13% 25%
13%
50%

Assuming global warming is happening, do you think it is...
Caused mostly by human activities 32
Caused by both human activities and natural changes 130
Caused mostly by natural changes in the environment 11
None of the above because global warming isn't happening 4
Other 2
Don't know 1

Which comes closer to your own view?
6%
49%
44%
1%
Most scientists think global warming is happening
There is a lot of disagreement among scientists about whether or not global warming is happening
Most scientists think global warming is not happening
Don't know enough to say

How worried are you about global warming?
17% 5%
26%
52%
Very worried
Somewhat worried
Not very worried
Not at all worried

How much, if anything, have you read or heard about ocean acidification?
8% 2%
37%
54%
A lot
Some
A little
Nothing

Personally, how well informed do you feel you are about how the Earth's "climate system" works?
7% 2%
36%
55%
Very well informed
Fairly well informed
Not very well informed
Not at all informed

Roughly how much carbon dioxide is in the atmosphere today?
150 parts per million 0
290 parts per million 3
350 parts per million 23
390 parts per million (√) 29
450 parts per million 13
Don't know 102
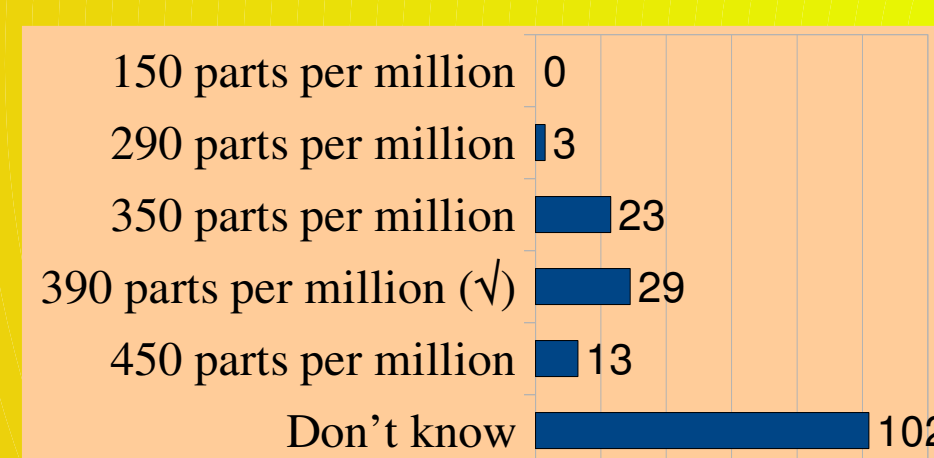
On average, how long does carbon dioxide stay in the atmosphere once it has been emitted?
A few days 5
A few years 42
A hundred years (√) 26
A thousand years (√) 16
Don't know 85
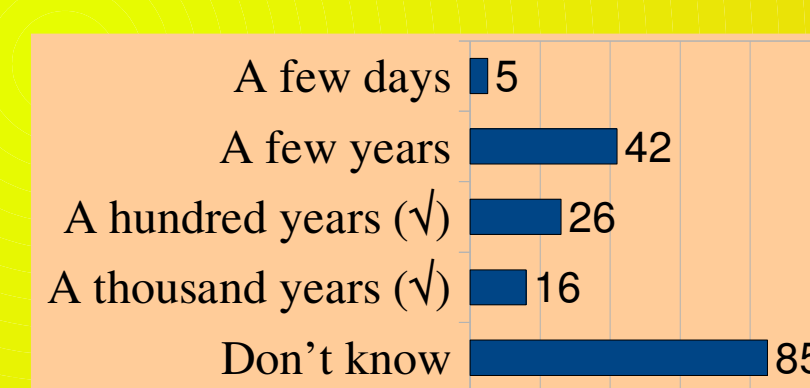
Which of the following countries emits the largest total amount of carbon dioxide?
Germany 0
China (√) 100
India 6
United States 42
Japan 3
Don't know 21
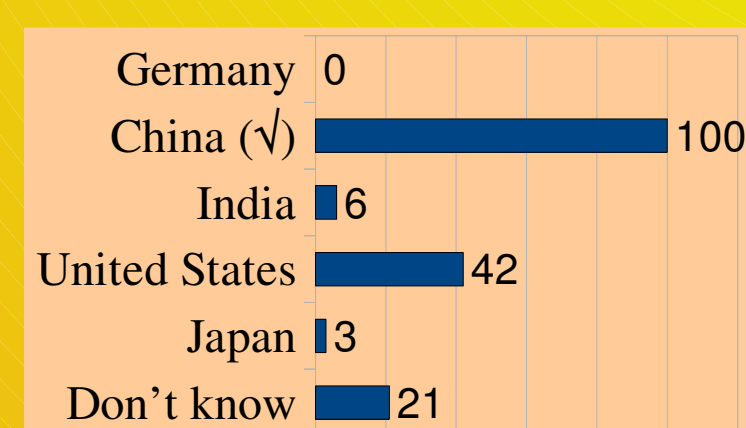
Which of the following countries emits the most carbon dioxide per person?
Germany 8
China 21
India 6
United States (√) 86
Japan 7
Don't know 43
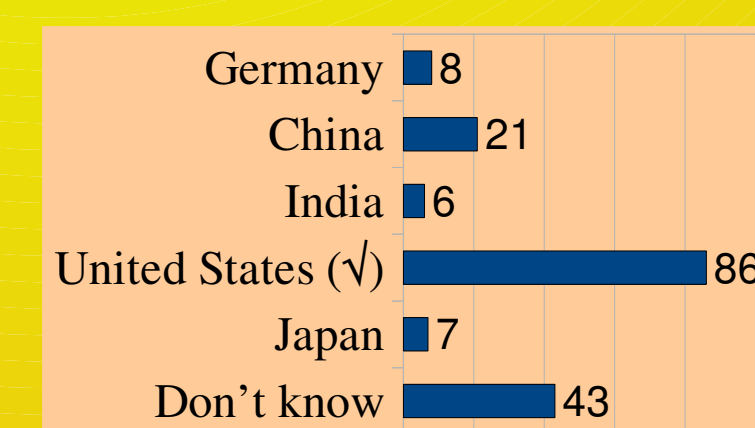
Which of the following can cause global sea levels to rise? (Percent of respondents)
Melting of land ice in Antarctica (T)
Melting of sea ice on the Arctic Ocean (T)
Melting of mountain glaciers (T)
Warmer ocean temperatures (T)
Increased evaporation (F)
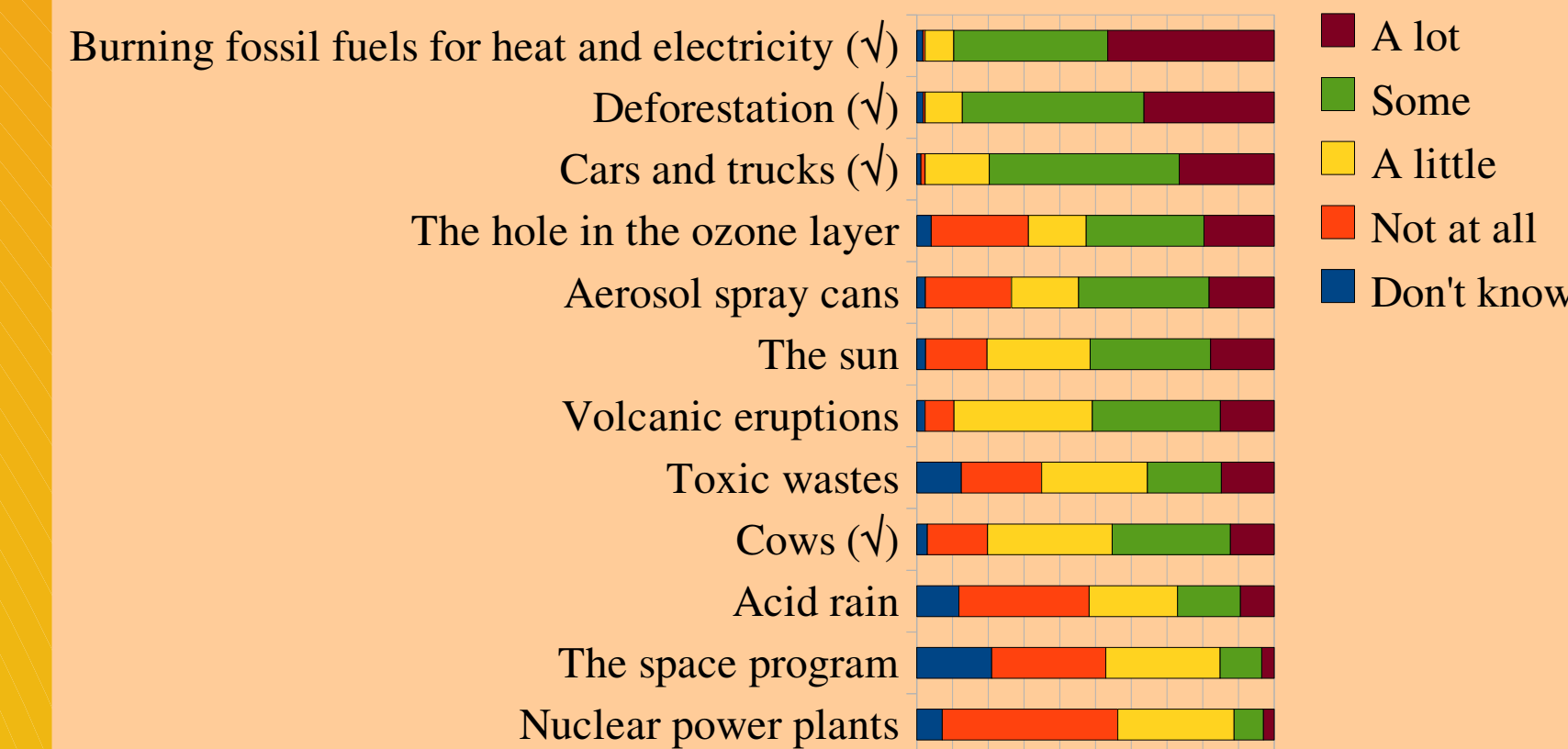Definitely true
Probably true
Probably false
Definitely false
Don't know
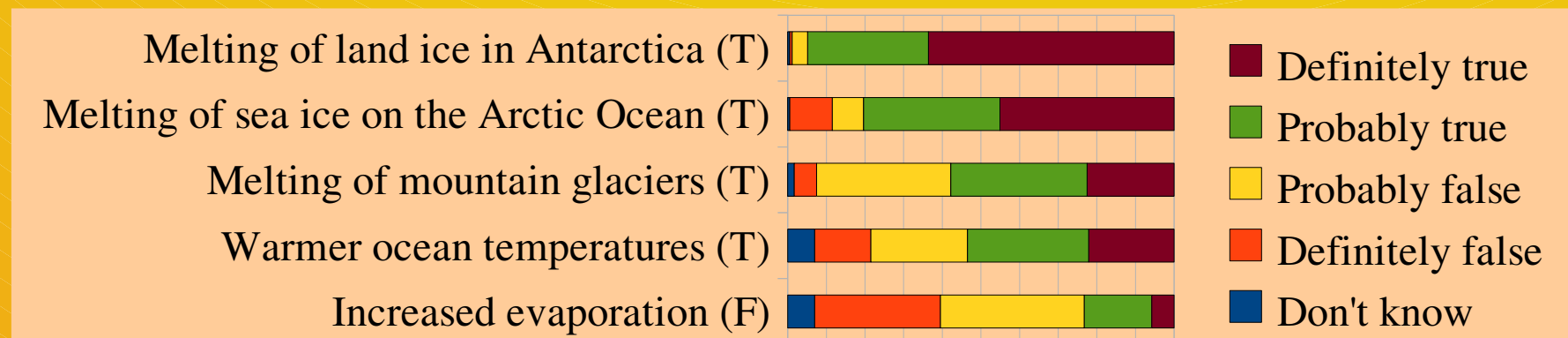
Which of the following gases in the atmosphere are good at trapping heat from the Earth's surface? (Multiple choice)
Carbon dioxide (√) 121
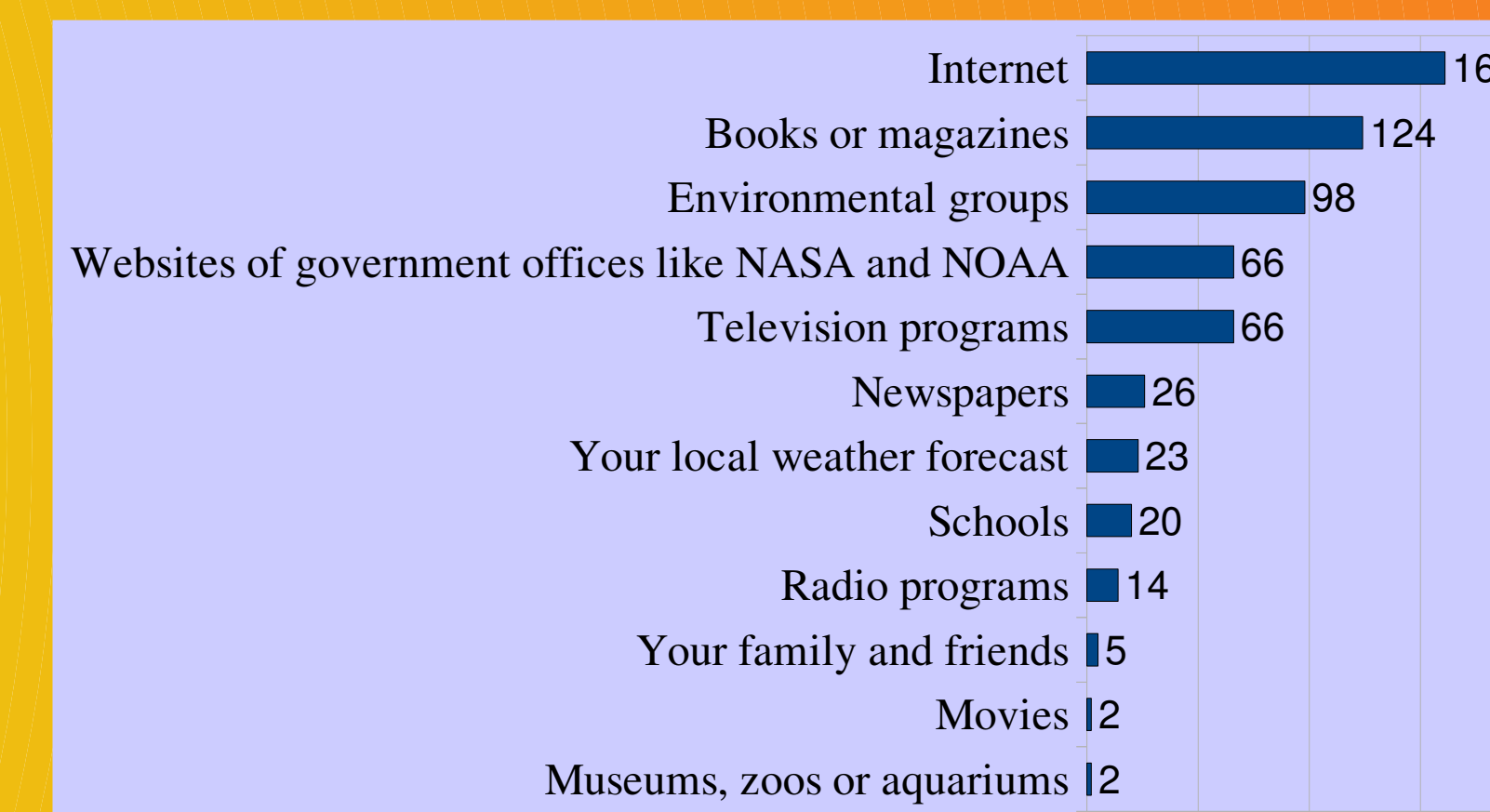Methane (√) 83
Water vapor (√) 73
Don't know 38
Oxygen 8
Hydrogen 6
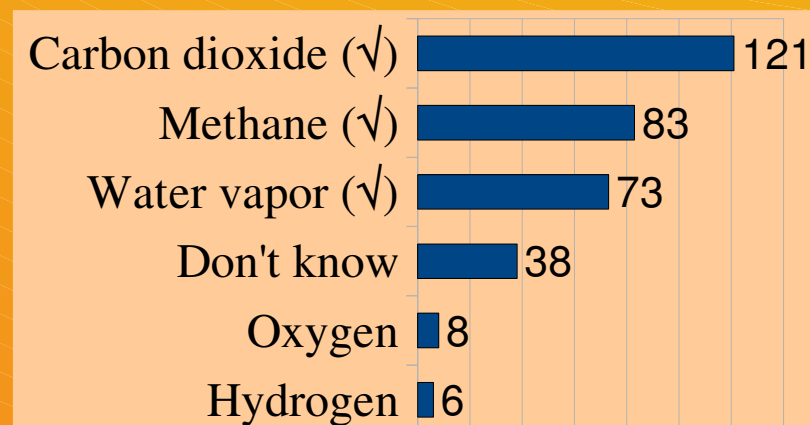
Which of the following are "fossil fuels"? (Percent of respondents)
Coal (√)
Oil (√)
Natural gas (√)
Wood
Hydrogen
Solar energy
Yes
No
Don't know
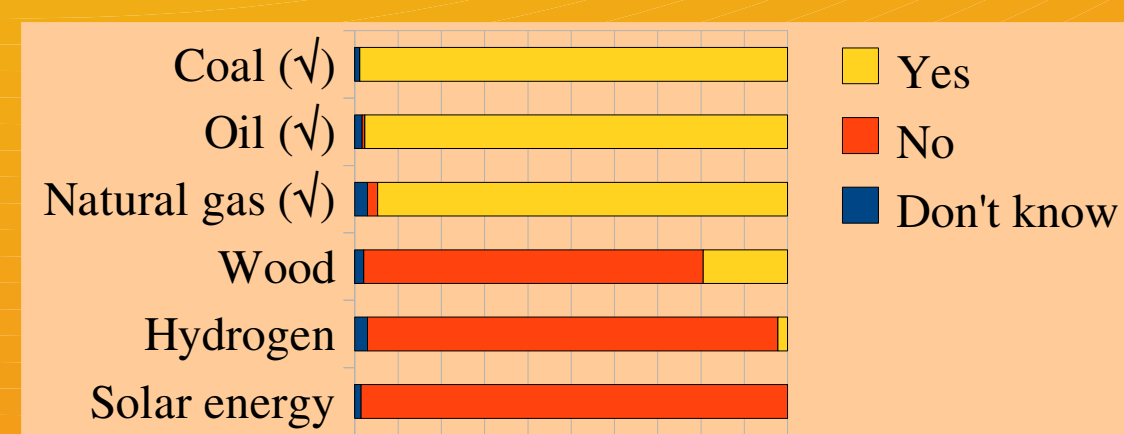
How much does each of the following contribute to global warming? (Percent of respondents)
Burning fossil fuels for heat and electricity (√)
Deforestation (√)
Cars and trucks (√)
The hole in the ozone layer
Aerosol spray cans
The sun
Volcanic eruptions
Toxic wastes
Cows (√)
Acid rain
The space program
Nuclear power plants
A lot
Some
A little
Not at all
Don't know

If you wanted to learn more about global warming, where would you go to get more information? (Multiple choice)
Internet 161
Books or magazines 124
Environmental groups 98
Websites of government offices like NASA and NOAA 66
Television programs 66
Newspapers 26
Your local weather forecast 23
Schools 20
Radio programs 14
Your family and friends 5
Movies 2
Museums, zoos or aquariums 2

How much do you agree or disagree with the following statement?

"I could easily change my mind about global warming."
3% 3%
35%
35%
59%

"Schools should teach our children about the causes, consequences, and potential solutions to global warming."
3%
35%
62%

"Our government should establish programs to teach the public about global warming."
10%
25%
65%

Strongly agree
Somewhat agree
Somewhat disagree
Strongly disagree
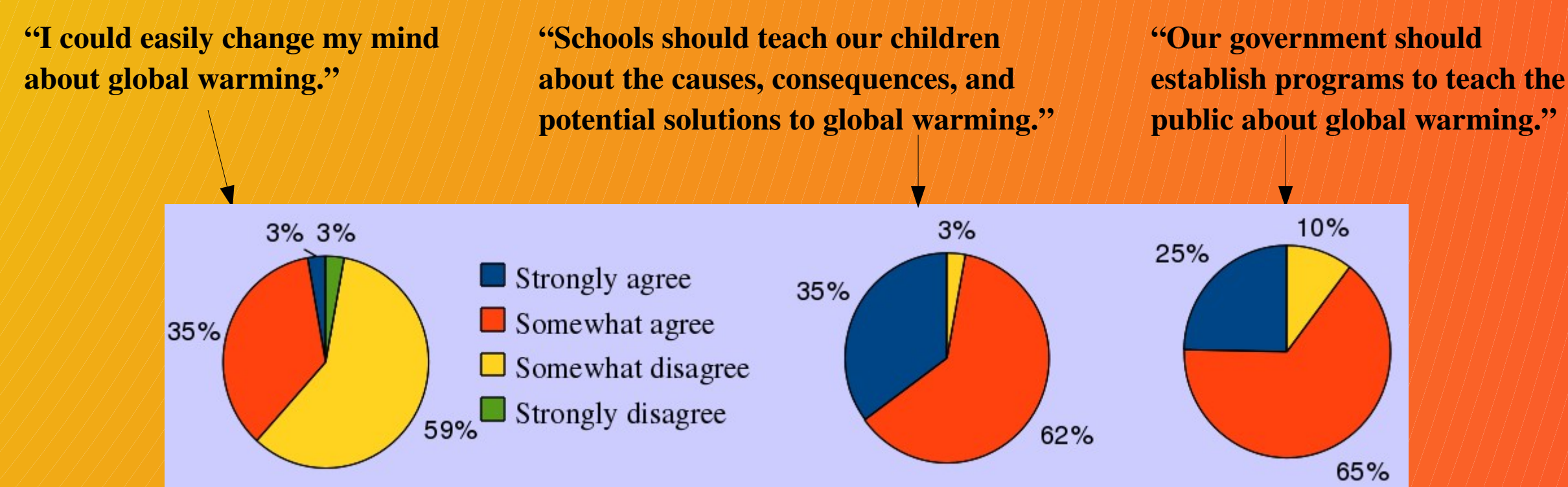
Discussion and Conclusion:

We assume as very positive the finding that 97% of respondents agree, that schools should teach our children about the causes, consequences, and potential solutions to global warming. 88% of respondents understand, that global warming is happening.

We presented just first results of the survey investigating understanding of the climate change topic by Czech upper primary teachers. Sample of 181 respondents contained also teachers who work at lower primary and high schools. Correlations will be analyzed in further research. The survey will be extended to the Slovak Republic.

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European Geosciences Union General Assembly, Vienna, 3-8 April 2011