Storms and wind power

There are more and more scientific studies showing that climate change increases the risk for weather disasters. Severe storms are apparently on the rise worldwide. A plethora of headlines, messages, and reports to this effect has appeared in national and international media. Here are a few examples:

- “El Niño pops up every three to seven years – it last appeared in late 1997/early 1998: devastating floods on the California coast caused millions of dollars in damage.” (Source: Spiegel Online, October 6, 2006)

- “Environmentalists think that extra-tropical cyclone Kyril is providing a preview of the climate of the future.” (Source: Handelsblatt, January 19, 2007)

- “Atlantic hurricane Dean caused heavy damage overnight Monday on the Caribbean island of Jamaica.” (Source: Die Presse, August 20, 2007)

In addition to these types of reports, the topic of wind is reported in another context. These stories primarily deal with the utilization of wind power as an energy source, as the following headlines show:

- “Wind power is becoming increasingly important for Europe. Electricity from wind power is on the rise in Europe: With capacity of nearly 150 gigawatts added in 2015, wind power is now one of the three most important energy sources on the continent.” (Source: n-tv, February 9, 2016)

- “Danish wind turbines set a new world record in 2015: According to the latest statistics, wind power now covers 42.1 percent of total electricity consumption in Denmark.” (Source: EurActiv, January 15, 2016)

- “Renewable energies: Allianz first wind investment in the US. Dozens of wind farms and solar parks in Europe are already owned by Allianz. This is the first time that the insurer is participating in a project in the United States.” (Source: Spiegel Online, February 8, 2016)

Assignment

The class should use the quotations to formulate an appropriate discussion topic. Half the groups should collect, discuss, and evaluate examples and developments related to “damage and dangers of wind.” The other groups should do the same for the topic of “how we can use wind”.
To properly discuss this topic, students will need basic information about storms and wind power. Students will compile this information as part of a “group expert rally” after being given broad inquiry topics.

Group expert rally process

- Four groups of experts will be formed for each main inquiry topic. In each expert group, the inquiry topic will be worked through based on the specified task. An option for consideration

© Siemens Stiftung 2018. Content licensed under CC BY-SA 4.0 international

is whether the two subtopics could be further specified, for example, what the subtopics mean for people's lives around the world and what they mean for us in our country.

- At the conclusion of the inquiry period, the class will form presentation groups made up of at least four different experts. Each expert will present a brief summary (approx. 3 minutes) of his or her inquiry results to the others in his or her group.
  Objective: Everyone knows more about all topic areas than before.
- In the subsequent group discussion with the entire class – falling back on the discussion topic – the knowledge acquired can be applied and reinforced.
  This task demands transferability and individual initiative, because Internet searches linking storms and wind power will deliver very few hits.
- Each presentation group can record its inquiry and discussion results on a group poster. If possible, the poster should also be created digitally in PowerPoint, Word, or a mind map program so that it can be presented using a projector. Manually created posters can be easily photographed and then presented digitally (including online).
  Alternative: As a homework assignment, each student summarizes his or her expert knowledge and the arguments discussed.

Inquiry topics – listing of topics

Basics of wind as a weather phenomenon

- Clarification of the terms wind, storm, hurricane, cyclone, tornado, and typhoon.
- How do winds and storms arise?
- Where do winds and storms occur in nature?

Changes in severity and behavior of storms

- What signs support the hypothesis that storms are increasing?
- In what previously unaffected areas do storms now occur?
- What are some of the reasons behind these changes?

Storms and their aftermath

- What are the effects of increased storm strength on the safety and standard of living of the world's population?
- What consequences for nature might we see and expect?
- What measures can be taken to protect the population?

Wind power – technology and development

- What exactly is meant by the terms "wind power" and "wind energy"?
- Which techniques of wind power utilization do we have today, as compared to earlier times?
- What is responsible for affecting/enabling these changes in wind power utilization?

Sources of information

A collection of selected Web links to work through this inquiry task is located on the media portal of the Siemens Stiftung in the media file "Storms and wind power (link list)".

© Siemens Stiftung 2018. Content licensed under CC BY-SA 4.0 international