

Benchmark II – The Current State of Affairs

In Benchmark I, you examined the objectives from the point of view of the scientific & environmental; social & cultural; economic; political & geopolitical domains to gain a comprehensive understanding and comparison of conventional energy, and nuclear energy in different countries in the world. You began to define issues related to nuclear proliferation, and nuclear terrorism.

In Benchmark II you will apply what you have already learned, and you will examine the objectives from the point of view of the scientific & environmental; social & cultural; economic; political & geopolitical domains to gain a comprehensive understanding of national and international controls of nuclear energy, the spread (proliferation) of nuclear energy in the world today, and some of the issues involved with the use and spread of nuclear energy.

Objective 1: Your task is to clearly demonstrate, in a carefully constructed project, an understanding of national and international controls of nuclear energy. Your project will explain the laws and organizations that monitor nuclear energy in your own country. Additionally, your project will explain multi-lateral treaties and international organizations related to nuclear energy. The project must be your own work with clear and correct citations from any work borrowed from others. All work not your own, including photos, graphics, multimedia, charts, and graphs must be credited within your text and in a bibliography.

Suggested activities: Note that these are suggested activities; they are not your tasks. You may choose to look at any, all, or none of them. The information you gain from doing these activities will help you to construct your project.

1. Compare and contrast, with examples, the laws and agencies that regulate nuclear energy in your country and those of one other country. For example, in the US, the agency is the Nuclear Regulatory Commission (NRC).
2. Demonstrate how these laws and agencies operate.
3. Identify how your national regulatory agency promotes the peaceful use of nuclear energy.
4. Build your own database so that you will be able to compare and contrast the multilateral treaties related to nuclear energy. Be able to

- show such information as when these treaties were adopted and ratified, and the major countries that have ratified these treaties and which ones have not.
5. Differentiate the articles of the Nuclear Non-proliferation Treaty (NPT) that promote peaceful use of nuclear energy. Relate ways that the NPT promotes peaceful use of nuclear energy and prevents proliferation.
 6. Be able to relate information about the International Atomic Energy Agency (IAEA) including its role and history.
 7. Familiarize yourself with the “Atoms for Peace” speech, investigate the historical background of the speech, and relate the role of the IAEA.
 8. Identify countries that have violated the terms of nonproliferation treaties and agreements and give the reasons these countries have given.
 9. Identify countries that have given up their nuclear weapons programs and their reasons for doing so.
 10. Compare and contrast other treaties, conventions, or agreements that relate to nuclear materials.

Objective 2: Your task is to clearly demonstrate, in a carefully constructed project, an understanding of the international spread of nuclear energy to countries in the world that have not had nuclear energy before. Your project will provide some of the reasons why these countries are pursuing nuclear energy and whether this pursuit might contribute to the proliferation of nuclear weapons. The project must be your own work with clear and correct citations from any work borrowed from others. All work not your own, including photos, graphics, multimedia, charts, and graphs must be credited within your text and in a bibliography.

Suggested activities: Note that these are suggested activities; they are not your tasks. You may choose to look at any, all, or none of them. The information you gain from doing these activities will help you to construct your project.

1. Identify countries in Asia, Africa, and the Middle East that have recently indicated their interest in nuclear energy.
2. Relate why some of these countries might be contemplating military nuclear programs.
3. Relate how nuclear proliferation in these areas would affect the stability of these regions.

4. Identify countries that could develop nuclear weapons;
5. Identify groups or organizations that might use nuclear or radiological materials to make a terrorist device.

Objective 3: Your task is to clearly demonstrate, in a carefully constructed project, an understanding of the international challenges related to nuclear energy. Your project will include the issues of benefit & risks, safety & security, the issues of waste management, and the issue of nuclear terrorism. The project must be your own work with clear and correct citations from any work borrowed from others. All work not your own, including photos, graphics, multimedia, charts, and graphs must be credited within your text and in a bibliography.

Suggested activities: Note that these are suggested activities; they are not your tasks. You may choose to look at any, all, or none of them. The information you gain from doing these activities will help you to construct your project.

1. Compare and contrast the risks and benefits of a new nuclear power plant in the area of your home. You might want to consider population, environment, energy demands, politics, etc.
2. Explain the probability of nuclear accidents in various countries in the world, including your own.
3. Identify possible causes of nuclear accidents. For example, consider geological, technical, and human factors.
4. Analyze and summarize an actual nuclear accident.
5. Relate how domestic controls in your country maintain the safety and security of nuclear materials and locations.
6. Distinguish how international controls (multilateral treaties) maintain the safety and security of nuclear materials and locations.
7. Differentiate the elements of safety and security in a nuclear power plant, including physical protection.
8. Explain how nuclear materials and/or spent nuclear fuel might be diverted to other uses.
9. Demonstrate different ideas of how spent nuclear fuel might be contained.
10. Relate how one country is reprocessing spent nuclear fuel.
11. Compare and contrast the environmental issues (for example, environmental waste produced, human health effects) related to nuclear energy and other forms of energy production.

12. Describe methods used to secure nuclear materials from unauthorized use.
13. Compare and contrast the motivations a country might have for wanting a nuclear weapon with those a terrorist or a terrorist organization might have for using a nuclear or radiological device.
14. Explain the risks involved in the transportation and storage of nuclear materials.

At the end of Benchmark II you will have created three original projects with internal citations and bibliographies both of which demonstrate your knowledge and understanding of the objectives of this Benchmark. Your projects will be your own work. When you refer to the work of others, you must have complete citations, and the work must also be in your bibliography. All work not your own, including photos, graphics, multimedia, charts, and graphs must be credited. You must have a bibliography of the resources you have cited.