

Example of essay on environmental effects of the production of electricity by var...

[Technology](#), [Development](#)



CURRENT STATUS AND POTENTIAL OF HYDROELECTRIC POWER

The main source of electricity in the US comes from the hydroelectric power plants. Hydroelectric power forms the largest producer of renewable power in the US. It produces 6.4% of the nations' total power. Hydroelectric plants exist in at least 34 US states. Some states especially in the Pacific North West generate majority of their power from hydropower resources. The list of the power stations in the US includes;

The US hydropower industry is committed to future growth and sustainable in every way. In future, it will focus on projects that maximize the benefits of the existing infrastructure such as addition of new and more efficient generating equipment to existing facilities. Further, it will seek to add electricity generating capacity to dams that have none today. Other areas of growth include closed-loop pump storage systems, which allow for additional renewable generation to be added to the grid, and new technologies like hydrokinetic, tidal and wave power that have the potential to open up vast amounts of renewable generation for the nation. The US hydropower industry could install 60000 MW of new capacity by 2025 depending on new policy changes. That only being 15% of the total untapped hydropower resource potential in the US meaning hydropower can remain a growing energy source for decades to come. The main obstacles to increasing the usage of this source of energy include lack of funding. Lack of funds to develop more hydropower industries could hinder further swift growth of this sources of hydroelectricity. Another foreseeable obstacle is the unavailability of proper sites for new large hydro facilities as the best sites have already

been developed. There are also regulatory hurdles as the regulatory requirements may be time consuming, expensive and redundant as well as tailored to past experience. Environmental tradeoffs are common as increasing hydropower generation can have negative ecological and recreational impacts. Climate change is another obstacle as climate change and the alteration of rainfall and temperature regimes can affect hydropower generation.

ENVIRONMENTAL AND PUBLIC HEALTH EFFECTS OF HYDROELECTRIC POWER

- Construction

Hydroelectric power plant construction leads to the green-house effect as large amount of vegetation growing along the riverbed are cleared to pave way for dam construction. Building of dams and reservoirs require large tracks of land and the ecosystem is disturbed through destruction of trees and natural habitats and even human settlements. Other consequences such as flooding and decay of causing the build up and release of methane, a potent green house gas. Dam construction along rivers also affects the flow of water thereby altering ecosystems, wildlife and the people who depend on it. Some vector borne diseases are associated with reservoir development, e. g. Malaria and schistosomiasis leading to potential increase in transmission of diseases and health impacts

- Mining

Effects include change of landscape of the land to create more space for reservoirs which in turn leads to breeding places for mosquitoes which cause malaria to humans. These concerns can be mitigated by ensuring proper

planning before construction process of the dams.

- Normal operations

Normal operations in the society are disrupted. Access roads may be blocked as a result of heavy machinery moving around. An itinerant workforce may contribute to health problems in construction camps and resettlement.

Construction may result to spread of diseases.

- Accidents

Deaths usually occur during tunneling due to rock fall accidents with the trains, and during drilling. An accident from dam failures as a result of poor project management leads to death of people in the surrounding areas. Oil spillages from transformers pollute the environment killing fish downstream and wildlife.

- Long term effects

Long term effects such as sedimentation are probable. Slowed flow rates of water causes severe losses in biodiversity and an increase in sedimentation permanently changing that area leading to environmental degradation and recreational impairment. . Damming causes changes in the replenishment of fresh water, thereby affecting fish habitats and the surrounding wildlife. This can be mitigated by technologies such as fish ladders which help salmons go up over and enter upstream spawning areas. Hydroelectric power requires overhead or underground power lines for transmission. Overhead power lines cause permanent displacement of human settlements in the affected areas. There economic activities are disrupted as well as their ecosystems and likelihood.

COMPARISON

The greatest environmental and public effect of hydroelectric power is water usage. The amount of water usage is often of great concern for electricity generating systems as populations increase and droughts become a concern. Still according to the US Geological survey, thermoelectric power generation accounts for only 3.3% of net fresh water consumption with over 80% going to irrigation. Likely future trends of water usage show thermoelectric power to be on its rise significantly. General numbers for fresh water usage of hydroelectric power generation as compared to coal are shown below;

This therefore shows that even water used at average case in hydroelectricity power generation is of higher volumes than the amount used in coal-related processes as a source of energy. Coal require a great deal of water for cooling but coal boilers can produce high steam temperatures hence require less cooling water relative to output.

Coal has diverse environmental effects than hydroelectricity . Coal burning releases CO₂ and because coal occurs naturally in combination with Sulfur, when burned produces Sulphur dioxide which causes acid rain. Hydropower generation causes less air pollution. While hydropower causes relocation of people, coal industry may restores mined land to or prepares it for more productive uses once surface mining is done.

Hydroelectric power technology should be promoted further because it is a renewable energy source as it uses the energy of running water. It also promotes guaranteed energy and price stability as it is the only large renewable source of electricity. Its cost benefit ratio, efficiency, flexibility and reliability assist in optimizing the use of thermal power plants.

Hydroelectric reservoirs contribute to the storage of water as rain water collect into large quantities which can then be used for irrigation.

Hydroelectric power helps fight climate changes as they produce small amounts of greenhouse gases. It also offers a significant contribution to development as hydroelectric installations bring electricity, highways, industry among other infrastructure. This leads to development and boosted economy, expansion of access to health and education, and improved quality of life . It creates job opportunities at a greater scale to the human population.