

# Term paper on miami environmental planning proposal

[Environment](#), [Electricity](#)



## **Introduction**

Planning energy supply system of a city is an important element of a municipal architecture (Lowman, 2009). Some prominent municipal planners described all electricity network of a city as its “ blood system”, along with potable water and safe roads. Improper construction practices may result in dramatic consequences for the city, especially under emergency circumstances (e. g. natural calamities, terrorist threats, etc.). Hurricane Katarina evinced complete incompetence of the Californian city planners to consider these issues (Kopytko & Perkins, 2011) (large parts of the affected cities were almost immediately cut off power what made effective evacuation, medical assistance and other operations less effective). Therefore, the academic world and the practicing engineers strongly recommend taking into consideration such “ lessons” in all future construction projects (Kenward, 2011).

The purpose of this research is to suggest the most optimal structure, budgeting and other issues, relevant to the construction in Miami.

## **Planning**

In the course of such planning, the engineers should always take into consideration the following important principles of engineering:

Safety is always a priority. In all construction projects, the engineers should firstly analyze possible negative impact, if any emergency happens (Purcell, 2002). All scenarios should be taken into account, including those, which can be artificially initiated by the humans (technical errors; terrorist attacks).

Interchangeability. All energy sources should be capable of being redirected

to the areas, where they are mostly needed (Lowman, 2009). For instance, as a result of a flooding hydroelectric power station may be temporarily paralyzed. In this case, all facilities of critical importance (such as hospitals, city councils, military points) should be connected to other power sources. Minimal negative impact to the environment. In the event of a disaster and full or partial destruction of the energy-generating unit, the impact inflicted to the environment should be minimized to the utmost extent. This issue is especially important with the nuclear power stations (Kenward, 2011).

Minimal financial costs. Nowadays, the costs of energy production and maintenance are soaring. Other areas of economy (both, state and federal) are in catastrophic needs of funding. Therefore, the engineers should take all possible efforts to minimize the costs, associated with energy production and delivery.

In the light of the above-mentioned mentioned principles, the following construction scheme is offered. The facilities, which will be supplying the city with electric power, will be one nuclear power station, hydroelectric power station and natural gas power station. The combination of these energy-generating facilities (as opposed to the construction of three nuclear/natural gas or hydroelectric power stations) is effective, because it helps to reach an equilibrium of safety, stability and minimal costs (Lowman, 2009).

### **The advantages and disadvantages of these power-generating units are the following:**

Nuclear power station (Producing capacity 1000 megawatts) is the most ecologically friendly option for this project, although it is the most expensive. Furthermore, the practice shows that nuclear-based power stations are

marked with exceptional stability, with minimal known occasions of power cuts, voltage jumps or other negative issues.

The biggest (and the only) disadvantage of a nuclear power station is that if safety system fails to react to an emergency, the results may be catastrophic for the local population, as well as for the local environment.

Natural Gas power station (producing capacity - 1000 megawatts) is effective, because it is one of the most stable solutions to supply the city with energy, while being among the safest for the local residents. However, the use of natural gas as the energy source is connected with a large number of detrimental toxic emissions.

Hydroelectric power station (producing capacity - 1000 megawatts) is a powerful and the least expensive solution (with the smallest monthly maintenance costs). However, it inflicts serious negative impact to the local fauna and flora by changing natural habitat of the many species.

## **Funding Required**

In order to implement this project, the following construction costs are necessary:

This chart indicates, that the engineering team will be able to meet the construction budget, allocated for this project (the budget is \$ 10 billion; the costs required are \$7, 835 billion)

Therefore, the constructors may (a) return the “ freed” financial resources to the state treasure, (b) invest them in improving safety conditions of the facilities or (c), they may spend them mitigating adverse environmental impacts (Purcell, 2002).

With regard to the annual maintenance of the facility, the following funding is to be provided by the city energy authorities.

**This data suggests that total costs required for the maintenance of the facility is consistent with the annual maintenance budget.**

Overall, from the financial viewpoint this project should be deemed as successful. Not only it manages to fit the initial construction budget, but it also gives makes it possible to provide extra funding for improving safety or addressing other important issues, connected with this project.

## **Summary**

Furthermore, (b) this “ combinative” approach is one of the least financially demanding. Finally, (c) if this construction scheme is approved by the city planning authority, the municipality will always have alternative energy sources, if functionality of the one of the elements of the system suddenly stops.

## **References**

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