

The Environmental Challenge International

...a student team competition



THE PROBLEM

The Purpose

The Environmental Challenge gives teams the opportunity to develop solutions to a mock environmental problem and have the experience of presenting their solution to a panel of environmental professionals. We do not give you a lot of numbers to crunch. We are more interested to hear about the issues involved, how you interpreted the problem, how you got to your conclusions, and how well you can communicate your thoughts. We want you to have fun! This exercise gives us all a chance to participate and gets the professionals of tomorrow to interact with the professionals of today.

The Problem

The Pacific Northwest is home to many forms of alternative energy production; wind, hydropower, solar, tidal, biomass, and previous nuclear explorations. Historically, electrical energy has been inexpensive and in ample supply. However, the last decade has seen a substantial increase in the demand for power in the Northwest and beyond, and rates have been climbing steadily. Forecasts indicate demand for electrical energy will exceed available generation capacity, particularly in the populated coastal areas. The expansion of traditional forms of electricity generation has been slow due to increased scrutiny during the permitting and high cost of fossil fuels. Nonetheless, traditional energy production remains relatively inexpensive compared to sustainable forms of energy production. By looking at the forecasts for population growth, home construction, fuel costs, new energy production projects, and current energy prices, the energy market in the Pacific Northwest is continually tightening.

Citing the demand for increased electrical energy in the region, Cole Burns proposed to build a new 1,000 MW Integrated Gasification Combined Cycle (IGCC) technology power generating facility in southeastern Washington or northeastern Oregon. In a headline newspaper article, Burns stated:

“We have an amazing opportunity to offset the impending energy shortage in the Pacific Northwest and beyond. We can offer hundreds of jobs to local communities to ensure that energy rates remain low for years to come. With the help of Senator Fuelé and the Committee on Energy and Natural Resources, we have been assured an expedited permit process and any assistance necessary to get the project heading in the right direction...”

Burns, a Portland, Oregon native and a supporter of the region's sustainability movement, and his Canadian partner/investor have come under a lot of criticism for the fossil fuel based power plant. Opposition groups have fought the plant at

state, national, and international levels citing that the plant will have an enormous effect on the regions beautiful environment:

“The Pacific Northwest is a pristine and beautiful place and is fortunate to have a rich, thriving environment. It would be devastating if unspoiled sites as the Columbia River, Columbia Basin, Cascade Range, and other natural wonders were to become polluted or no longer visible. Burns has been an advocate of many sustainability projects in the Portland region; we are horrified that he has proposed a new IGCC facility in an economically deprived and environmentally sensitive region when so many other “green” options are available. While we applaud Burns for *attempting* to offset all the air pollution emissions, that does not compensate for the destruction that would occur within the region. We, at Start Now!, will continue to petition and do everything in our power to stop the construction of the IGCC facility...”

--Hugo Trease, President of Start Now!

Amidst the criticism of the project, the Energy Facility Site Evaluation Council (EFSEC), which oversees power plant permits, rejected Burns’ proposal stating that the plant did not meet requirements to limit emissions of greenhouse gases. Burns’ Canadian partner provided the following to statement:

“We live in a world where we rely on energy for our daily needs but we also live in a world where we need to protect and conserve our valuable natural resources. There is a lot of opportunity within the region to advance the state of sustainable forms of energy and we will investigate all potential options, evaluate their potential, and integrate, if promising, sustainable forms of energy into our energy production. While we have met a road block in regards to our current plans, we still have an obligation to provide the much needed power to the region. We will evaluate the bases for EFSEC’s denial of our permit, but we will also evaluate and additionally analyze sustainable forms of energy that may help us achieve our energy production goals. If we can’t have an IGCC facility, we’ll have some type of sustainable form of energy that will be supported.”

--Burns’ Canadian investor

Your team represents a group of consultants who have been hired by Cole Burns and his Canadian investor to assess the denial of the proposed IGCC facility and to evaluate and analyze sustainable forms of electrical energy production, including distributed power options. Your team must also advise the client regarding the political and economic implications of the IGCC facility and alternative generation options, as well as environmental impacts including air,

water, and hazardous waste. Each strategy will require the facility and equipment to meet local, state, and federal requirements.

As consultants, you must understand the processes and provide solutions to any potential environmental issues. You must also address all public relations concerns and any environmental justice issues that may arise. While Burns is not looking for a detailed budget at this time, it is important to understand that there are budget limitations and spending less is always better. You do want to remain as Burn's primary consultant.

The Expectation

Detailed calculations are not the most important part of this challenge; logic train, process, conceptualizations, and creativity are most important to the proposal and presentation composition. You also have to present your thoughts in a public forum. Logic of your vision and clarity in your presentation are critical. Remember you can come up with assumptions, but they will need to pass the "straight-face" test. This is like the real world!

We have expectations with regard to your team's Proposal and Presentation (see below). The **Proposal** expectations include identifying each team member by name and the role they will have in the presentation (i.e. "Nilly Willy" is going to be engineer and will address waste issues, "Jim Been" is going to be your air expert, "Justin Timberlooked" is going to be our 'architect', and "Martha Stuart" is going to be your shaman etc., - you put in the disciplines that you think you need). In the proposal you should have an outline of the approach that you are going to take and the issues that you will be discussing. **Remember you will have a maximum time of 15 minutes to present your plan and you have a five (5) page limit for the proposal submittal.**

For the **Presentation**, your team will need to demonstrate your understanding of the issues that you addressed in your proposal. Sustainable approaches for these and other site issues are of great interest to the owners. The winning team presentation will be strong in approach, logic, clarity, application, and creativity.

For further guidance, please refer to the **PROTOCOL** document on the A&WMA's ACE website.

The Tweak

No matter how much you do and know, in real life unexpected events and expectations can and do occur. To this end, expect (when you pick up your ECi Registration Packet at the Student Welcome Booth upon your arrival to ACE) some late breaking information that might alter your approach and/or require your plan to evolve. The problem and the tweak will require that you find and talk to "experts" and attend technical sessions, during the conference, for answers and important information.

ATTACHMENT A

Energy Investments for the Future, Corp.
Cole Burns, President
2050 Green Lane
Portland, Oregon 97298

August 13, 2007

The Honorable I. Fuelé
United States Senate
Washington, D.C. 20515

Dear Senator Fuelé:

In the Pacific Northwest we are fortunate to have low electricity costs but demand is increasing and prices are rising. Energy Investments for the Future, Corp. has proposed a 1,000 MW Integrated Gasification Combined Cycle (IGCC) technology power generating facility to offset future demand and high energy costs. Recently, a decision was made to reject our proposal for this plant. While we understand that there are issues associated with our proposed plant, we are still pursuing all available options.

The facility, located in southeastern Washington or northeastern Oregon, will be state of the art and first of its kind power plant. All equipment used will be the best available control technology and we intend to offset more emissions than required. Additionally, all buildings will be certified "green," we will supplement our power plant's energy generation with alternative methods, and will strive to be the most efficient power plant in North America! Additionally, hundreds of jobs will be created and revitalize an economically depressed region!

Currently we have an additional investor who is committed to creating this high-tech facility and has stood steadfast with our "green" goals.

With the current permitting road blocks, **WE NEED YOUR SUPPORT.** Given your role on the Committee for Energy and Natural Resources and your local support we will create the power plant of the future!

Please don't hesitate to contact me at any time and I hope our contributions are helping your campaign.

Thank you,

Cole Burns, President
Energy Investments for the Future, Corp.

ATTACHMENT B

Project as Proposed to EFSEC:

1,000 megawatt (net) Integrated Gasification Combined Cycle (IGCC) technology power generating facility.

The IGCC design is based on a wet slurry gasification process using Powder River Basin coal to produce a synthesis gas (syngas) comprised mostly of hydrogen and carbon monoxide. Powder River Basin coal will be brought to the site by unit trains.

Best Available Control Technology (BACT) is proposed as:

- Enclosed fuel storage and material handling systems,
- Advanced syngas cleaning system to remove 95% of the sulfur in the syngas
- Activated carbon canisters to remove 90% of the mercury found in the coal
- Selective Catalytic Reduction to achieve 5 ppm NO_x

To mitigate greenhouse gas emissions, partial removal of carbon from the syngas and greenhouse gas offsets will be pursued.

Water demand for the facility is estimated at approximately 7,800 gallons per minute to be obtained from the Columbia River or tributary depending on negotiation of water rights.

Slag from the gasifiers to be sold for other industrial and public uses.

The facility will be connected to a Bonneville Power Administration substation by a new five mile long transmission line.