



***Design of Biofuels
(Biodiesel and
Bioethanol)
Production Facility
for Renewable
Energy Generation***

...Lets not be cruel, use alternative fuel

Code of Ethics

IPRO 316

SPRING 2009

Faculty Advisor: S. Parulekar

Overarching Standard:

We will work together in a professional manner, adhering to ethical standards and existent regulations in coming up with a socially, economically and environmentally sound design.

1st Layer - The Law:

- **Canon:** The process design to produce biofuels will comply with all Federal, State and Local laws regarding proper disposal of any waste by-product from the chemical plant, keep stringent records that can be produced on demand, and have citations of all references with regards to the project.
- **Pressure:** In order to decrease the costs associated with the process, a company may decide to not properly dispose of waste and conceal records that do not comply with the law.
- **Risk:** A company may continue violating these laws, which will lead to government involvement and consequently putting their employee's jobs in jeopardy.
- **Pressure:** In order not to have to pay higher taxes for emitting more pollution into the atmosphere, as per government regulations, the company may not be entirely honest about the level of waste being produced by their process plant.
- **Risk:** The improperly disposed waste products would seep into the air, soil and/or rivers, causing pollution, which would be in violation of environmental laws.
- **Pressure:** Members may be required to constantly come up with quick solutions to problems that arise during the development of the project; thus members often look up multiple sources.
- **Risk:** Members may forget to quote sources or give credit where needed, hence causing them to unknowingly infringe on copyright laws.
- **Measure:** In order to ensure that the levels of waste being produced by the process plant are recorded as transparently as possible and that the company is following all rules and regulations, the company should set strict ethics guidelines and make employees adhere to them in order to ensure that every individual is aware of what information needs to be disclosed and how they are to go about doing that.

2nd Layer – Contracts & Agreements:

- **Canon:** The employees of the company that work on the biofuel process will abide by all contracts and agreements in regard to the chemical engineering industry.
- **Pressure:** In an effort to hire cheaper employees, the company may hire employees that aren't licensed engineers (they haven't taken the qualifying exam).
- **Risk:** If strong ethics guidelines aren't provided in the written contracts which they are required to sign upon being employed, these employees will not perform their tasks in a proper, stringent manner.

- **Risk:** If the engineers aren't fully competent in working a process plant, it may endanger other employees due to technical difficulties that serve as a safety risk.
- **Measure:** All guidelines should be clearly expressed in the written contracts employees are required to sign upon employment, which allows them to work in a safe environment with tasks being performed in a proper manner.

3rd Layer - Professional Code of Ethics:

- **Canon:** We shall handle the project in a responsible manner, parallel with the ethical standards of being students as stated in IIT's Academic Integrity guidelines.
- **Pressure:** Members are required to produce sizeable deliverables on a weekly basis.
- **Risk:** Violations of IIT Academic Integrity guidelines.
- **Risk:** Team members claim credit for the work of others.
- **Risk:** Reduce the quantity/quality of testing in order to achieve minimal expected results.
- **Measure:** Work will be assigned fairly and evenly amongst group members so that the utmost level of professionalism is maintained.

4th Layer - Industry Standards:

- **Canon:** The employees of the biodiesel company will abide to the rules of industrial standards.
- **Pressure:** Heavy deadlines may result in disregard of safety procedures.
- **Risk:** Improper techniques used may result in danger to the company.
- **Risk:** Failing to follow rules may result in risking the lives of the employees.
- **Measure:** In order to produce a safe environment, the company will set strict rules and guidelines and make sure the employees fully abide to them.

5) Social, Civic & Geographic Communities:

- **Canon:** The biofuel produced must be safe, along with economically and environmentally friendly, exceeding standards currently by engineering professionals for fuels used by the public.
- **Pressure:** The biofuel production may create environmentally unfriendly byproducts.
- **Risk:** Overlooking the potential impacts of the design on the immediate geographical communities and the environment as a whole.
- **Pressure:** The biofuel produced may be of inferior quality.
- **Risk:** The Company that produces the biofuel may be liable for damage to any engine or mechanical equipment that consumes it.
- **Measure:** The biofuel produced will meet or exceed a high standard that has been thoroughly tested.

6) Personal Relationships:

- **Canon:** Members shall work in a professional and objective manner, avoiding all forms of interpersonal conflicts and resolving them if and when they occur.

- **Pressure:** To create a transparent research system that clearly acknowledges all sources.
- **Risk:** Breaking the confidentiality of information from contacts that wish to remain anonymous.
- **Pressure:** Contributing ideas and opinions openly to improve project design.
- **Risk:** Conflict of ideas among members that leads to misunderstanding.
- **Measure:** Group leaders and members will work to ensure that everyone is on the same level in regards to respecting all IPRO contacts and members.

7) Moral and Spiritual Values:

- **Canon:** Members are allowed to candidly express their concerns and beliefs so that a common understanding is reached while on the direction of the project.
- **Pressure:** To treat all members with respect, so that the project may be completed in an efficient and timely manner.
- **Risk:** Creating conflicts between members because of personal beliefs.
- **Measure:** If a conflict occurs, the members involved or others knowing about it will inform a group leader or the teacher to help settle it.