**Assessment of the Presidential Green Chemistry Award Winners using Green Chemistry Metrics**

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The goal of this case study assignment is to evaluate the work that has received the Presidential Green Chemistry Challenge Award using green chemistry metrics, principles, and design strategies[[1]](#footnote-1). Throughout the 20 years of the awards program, EPA has presented awards to 104 winners. Since its inception, in 1996, EPA has received over 1,500 nominations. By recognizing groundbreaking scientific solutions to real-world environmental problems, the Presidential Green Chemistry Challenge has significantly reduced the hazards associated with designing, manufacturing, and using chemicals.

Through 2015, the 104 winning technologies have made billions of pounds of progress, including:

* 826 million pounds of hazardous chemicals and solvents eliminated each year—enough to fill almost 3,800 railroad tank cars or a train nearly 47 miles long.
* 21 billion gallons of water saved each year—the amount used by 820,000 people annually.
* 7.8 billion pounds of carbon dioxide equivalents released to air eliminated each year—equal to taking 810,000 automobiles off the road

For this assignment, you are to work as part of your team to identify one particular winner of the PGCC Award[[2]](#footnote-2). You will need to research the different award winners and choose your award according to the availability of information as well as merit of the award. The assignment has two parts.

The first part is to perform a critical review of the awarded technology. Using information available on the EPA website, company website, press releases, sustainability reports, or any other resource, you must compile information into a written report. Be sure to reference any information or figures used in your report. The report should include the following information:

* Background of the company, size, scale, industry sector, etc.
* Summary of the awarded technology, how it fits within the company’s portfolio, and impact on society.
* Evaluation of the awarded technology using green chemistry metrics and evaluation tools for comparison against the competing or displaced technology or product. Multiple levels of evaluation should be included ranging from Green Chemistry Metrics (E-factor, Atom Economy, and RME) to the 12 principles of green chemistry to in-depth analysis that include Life Cycle Assessment, pollution prevention, and societal implications.
* Concluding personal opinion of the technology and real impact on society.

In your evaluation, you are strongly encouraged to go beyond what is presented in internet literature. For example, you may research the traditional methods of synthesis for an awarded product and then apply GC metrics, such as Atom Economy, which may not be available in the product literature. Another example may include researching the potential hazards associated with the displaced chemicals (toxicity, volatility, carcinogenicity) and how this technology will benefit human health and the environment.

The second part of the assignment requires you to contact the award winners by whatever means necessary (email, phone, in person, social media, etc.) and interview them based on 1) what the PGCC Award has meant to them and their career and 2) what personal benefit have they gained from working the award winning technology. For the sake of consistency, you should include slight variations of these questions as well as any other questions you would like to ask. Ample bonus points will be awarded if your interview of the award winner is made available in a recorded audio or video file.

Here is an example form of contact you may use with the minimum required questions:

Dear xxxx:

First of all, I would like to congratulate you for being awarded the Presidential Green Chemistry Challenge Award in XXXX for your work on developing ­­­­­­­­­­­­­­­­­­­­­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. I am a \_\_\_ Chemical Engineering major at Clemson University and am currently taking a course on Green Engineering. We have been covering green chemistry and green engineering metrics and are using the PGCC Awards as a case study. I have been researching your developed technology and would like to ask you a few personal questions about how this technology and award has influenced career and goals. Specifically:

* What has your development of this technology meant to your company?
* When you began working on this technology, what were your motivating factors and was green chemistry or green engineering a part of your mindset?
* Has developing this technology or winning this award influenced your professional outlook, personal goals, or definition of success?
* What has being awarded the PGCC Award meant to your company and how has it influenced your career?
* Are there any professional experiences related to green chemistry or green engineering that you would like to share?
* Do you have any advice for a young chemical engineer beginning my career in industry?

Thank you very much for your time and answering these questions. My professor, Dr. Chris Kitchens, may want to use your responses to these questions in his course material and in online teaching modules. Please let me know if you have any objections to this. If he does decide to use this in his teaching materials, then he will allow you to review material before release.

Once again, thank you for sharing your experience and outlook with me and congratulations on your award.

Best Regards,

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1. http://www2.epa.gov/greenchemistry [↑](#footnote-ref-1)
2. http://www2.epa.gov/greenchemistry/presidential-green-chemistry-challenge-winners [↑](#footnote-ref-2)