

The ol' college try

How two interns calculated the amount of carbon dioxide created in manufacturing a 737

By Eric Fetters-Walp

Eric Greenwald and Chunjiang “Stella” Huang faced a daunting challenge during their internship at Boeing this past summer: Devise a way to calculate the amount of carbon dioxide created by the manufacture of a Next-Generation 737-800 jetliner. It was something no one else had tackled, much less in a span of 12 weeks.

Christer Hellstrand, Capabilities and Processes director for Environment, Health and Safety in Renton, Wash., got the idea to study the issue when EHS Vice President Mary Armstrong mentioned that a British supermarket chain had added carbon footprint information to product labels for consumer awareness. “Understanding our carbon footprint is part of our effort to aggressively reduce greenhouse gas emissions from our operations,” Hellstrand said.

Greenwald and Huang discovered during their busy months of research that the majority of carbon emissions generated from an airplane’s production comes from producing and shipping raw materials. They also calculated that, although significant, the carbon footprint of building an airplane is much smaller than that of operating the airliner over its lifetime.

The interns’ methodology can be used to determine the carbon footprint of other jets in production, and Greenwald said he hopes their results spur further work toward reducing carbon emissions.

“As we design our next airplanes, we now have a baseline to look at the improvements in manufacturing’s carbon footprint compared to older models,” Hellstrand added.

Greenwald, 21, and Huang, 24, started their work in May, after EHS began focusing specifically on the carbon footprint question. Greenwald is studying chemical engineering and applied mathematics at the University of Colorado at Boulder. Huang is a University of California, Berkeley, senior working toward a degree in chemical engineering.

The students said the opportunity to gain experience at a company of Boeing’s size and scope attracted them.

“Boeing is a big company and an international company, and my career plans include doing some international projects in the future,” Huang said.

Boeing’s most important environmental focus is to reduce the impact of its products and services in operation, so the carbon footprint of airplanes in flight already is well studied. Documenting carbon dioxide emissions from manufacturing an airplane meant



tracing back to the extraction or production of raw materials—aluminum, steel, plastics and more. The pair then worked forward up to the plane’s delivery to a customer, accounting for the electricity, natural gas and fuel used at each step.

To establish a methodology that covers something so complex, the interns consulted with a University of Washington professor and then gathered data from 18 different groups within Boeing. That was the most difficult part, Greenwald and Huang agreed. However, it also gave the duo an unusual glimpse of the spectrum of departments within the company, Huang said.

Once Greenwald and Huang finished their methodology and findings, they presented their results to the EHS leadership and the Airplane Programs leadership team in Seattle. “People were amazed at how much they got accomplished,” Hellstrand said.

For Greenwald and Huang, collaborating with each other and Boeing employees provided a valuable experience, they said. Additionally, they appreciated being trusted with such an important assignment.

“The whole development of something that hadn’t been done before was interesting to me,” Greenwald said.

Hellstrand said the challenge also gave them a taste of what problems the company’s engineers contend with all the time. Huang clearly enjoyed it, as she plans to return to Boeing after she graduates this winter. ■

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PHOTO: Eric Greenwald and Stella Huang, college students who interned at Boeing this past summer, calculated how much carbon dioxide is created in manufacturing a Next-Generation 737-800 airplane. WILL WANTZ/BOEING