

DID YOU KNOW?

According to the U.S. Energy Information Administration, power plants emitted more than two billion metric tons of carbon dioxide in 2013. If we could convert this into diesel fuel with an efficiency of just five percent, we could produce tens of billions of gallons of diesel fuel annually just from this single source.

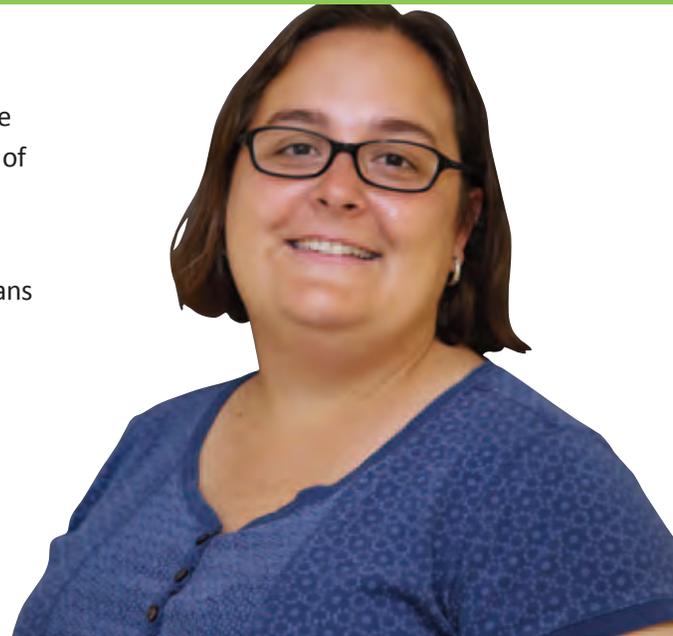
—Dr. Heather Meylemans

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What is an Energy Warrior?

An Energy Warrior is a person who is trying to make our world more energy independent by being more energy efficient in all aspect of their lives. Download the Energy Warrior app at <http://greenfleet.dodlive.mil/energy/energywarrior> for more insights.



ENERGY SECURITY ENHANCES COMBAT CAPABILITY

Did you know that according to the U.S. Energy Information Administration, power plants emitted more than two billion metric tons of carbon dioxide in 2013?

What is solar fuel?

Solar fuel is the idea of converting sunlight into a liquid fuel. My research focuses on taking the sun's energy and the carbon dioxide found in our air and converting it into a liquid fuel feedstock such as methanol.

What is our biggest energy challenge?

Carbon dioxide is a big problem for our environment. So we are looking for a way to not only mitigate its impacts but find a useful purpose for it. The challenge we face is efficiently turning carbon dioxide into something useful. Plants do this relatively well—at one to two percent efficiency, since that's all they need to live. But the fact is that they are able to transform carbon dioxide from the air into sugar. As a result, we know that there has to be a way for us to mimic and improve upon that process. We have to be able to change and improve the

process plants have developed over time. Ideally, our goal is to develop a process that's 10 to 20 percent more efficient.

What role could solar fuel play in securing our nation's energy future?

Solar fuel is immensely important to helping our country achieve energy independence. Everyone has access to the sun and carbon dioxide—the two main ingredients for the technology I am researching. Developing solar fuels could reduce some of the conflicts over limited energy resources. And if we're able to develop a device that is reasonably-sized, our warfighters will be able to easily transport the technology to remote areas around the world. They won't need to have the fuel processed in a huge power plant. Theoretically they could be making their own fuel on location rather than having to haul it with them or refuel at sea. That's our ultimate goal—to develop a product that supports our warfighters around the world.

If successfully developed, solar fuels could help our country reduce its dependency on fossil fuels and change the world. That's why I do this. And the fact that there's an entire group of chemists working on this right now, trying to solve this very problem, is very motivating.

