Final Outreach Report Template
Year Two

Team: University of Wisconsin - Madison
Name of Outreach Coordinator: Andrea Parins
Phone number and email of Coordinator: (920) 327-0697 alparins@gmail.com
Date posted: May 7, 2010
I. Communications Plan

- Expand outside of the University of Wisconsin – Madison campus area
- Focus on influencer campaign
- Update website domain and design
- Increase social media presence

II. Outreach Activity Detail

A. Media Relations

<table>
<thead>
<tr>
<th>Media Type (Television, Radio, Print)</th>
<th>Media Outlet and Reporter's Name</th>
<th>Date</th>
<th>Location</th>
<th>Coverage Origin (List name of News Release or Event)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print</td>
<td>Chevy Muscle Cars.com, reporter n/a</td>
<td>9/22/09</td>
<td>The Internet</td>
<td>Blog network</td>
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<tr>
<td>Print</td>
<td>Wisbusiness.com, reporter n/a</td>
<td>10/5/09</td>
<td>Madison, WI</td>
<td>News Release: UW-Madison, Hybrid team will receive vehicle from GM</td>
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<tr>
<td>Television</td>
<td>Channel 3 News, Emily Roloff</td>
<td>10/10/09</td>
<td>Madison, WI</td>
<td>Event: Vehicle donation ceremony</td>
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<tr>
<td>Print</td>
<td>Detroit Free Press, Staff and News Services</td>
<td>10/18/09</td>
<td>Detroit, MI</td>
<td>Event: Motor City Badgers' Road Trip Rally</td>
</tr>
<tr>
<td>Print</td>
<td>Naperville Sun, reporter n/a</td>
<td>10/25/09</td>
<td>Chicago, IL</td>
<td>News Release: Waubonsie grad leads hybrid team at UW</td>
</tr>
<tr>
<td>Print</td>
<td>University of Wisconsin Engineering website, reporter n/a</td>
<td>10/28/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers' Road Trip Rally</td>
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<tr>
<td>Print</td>
<td>University of Wisconsin Energy Institute website, reporter n/a</td>
<td>10/29/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers' Road Trip Rally</td>
</tr>
<tr>
<td>Print</td>
<td>University of Wisconsin News website, reporter n/a</td>
<td>10/30/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers' Road Trip Rally</td>
</tr>
<tr>
<td>Print</td>
<td>The Isthmus, reporter n/a</td>
<td>10/30/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers' Road Trip Rally</td>
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<td>Print</td>
<td>Allbusiness.com, States News Service</td>
<td>10/30/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers’ Road Trip Rally</td>
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<td>Print</td>
<td>Wisbusiness.com, reporter n/a</td>
<td>11/2/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers’ Road Trip Rally</td>
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<td>Print</td>
<td>River Falls Journal, Vera Roy-Stoeberl</td>
<td>11/5/09</td>
<td>River Falls, WI</td>
<td>News Release: Local student works on driving into the future</td>
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<td>Print</td>
<td>Wisconsin State Journal, Neighborhood section, reporter n/a</td>
<td>11/6/09</td>
<td>Madison, WI</td>
<td>News Release: Middleton native to help develop EcoCar hybrid</td>
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<td>Print</td>
<td>Wisconsin State Journal, Amelia Vorpahl</td>
<td>11/13/09</td>
<td>Madison, WI</td>
<td>Event: Motor City Badgers’ Road Trip Rally</td>
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<td>Print</td>
<td>Capital Times, On Campus section, reporter n/a</td>
<td>11/20/09</td>
<td>Madison, WI</td>
<td>News Release: Motor City Badgers’ Road</td>
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<td>Print</td>
<td>Bucky Wagon Blog, Sandra Knisely</td>
<td>12/1/09</td>
<td>Madison, WI</td>
<td>News Release: Hybrid team to showcase vehicles at Quaker Steak &amp; Lube</td>
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<td>Print</td>
<td>University of Wisconsin Engineering Website, reporter n/a</td>
<td>12/6/09</td>
<td>Madison, WI</td>
<td>Event: Vehicle team showcase at Quaker Steak &amp; Lube</td>
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<td>Print</td>
<td>Wisconsin Dells Events, Anna Krejci</td>
<td>12/6/09</td>
<td>Wisconsin Dells, WI</td>
<td>News Release: Dellona student leads team to build EcoCar</td>
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<td>Bucky Wagon Blog, Sandra Knisely</td>
<td>12/7/09</td>
<td>Madison, WI</td>
<td>Event: Vehicle team showcase at Quaker Steak &amp; Lube</td>
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## B. Education

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
<th>Location</th>
<th>Audience</th>
<th>Participants</th>
</tr>
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<tbody>
<tr>
<td>Hybridfest</td>
<td>7/18 - 7/19-09</td>
<td>Alliant Energy Center Madison, WI</td>
<td>Public</td>
<td>Glenn Bower, Adam Richards</td>
</tr>
<tr>
<td>Girl Scout Badge Day</td>
<td>10/3/09</td>
<td>Engineering Hall Madison, WI</td>
<td>Youth</td>
<td>Ray Ulen, Alex Viser</td>
</tr>
<tr>
<td>Homecoming Parade</td>
<td>10/16/09</td>
<td>State Street Madison, WI</td>
<td>Public</td>
<td>All Team Members</td>
</tr>
<tr>
<td>Snap-On Headquarters visit</td>
<td>11/6/09</td>
<td>Snap-On Headquarters, Kenosha, WI</td>
<td>Snap-On Employees</td>
<td>Glenn Bower</td>
</tr>
<tr>
<td>Girl Scout Badge Day</td>
<td>11/7/09</td>
<td>Engineering Hall Madison, WI</td>
<td>Youth</td>
<td>Drew Kozmoski, Adam Richards</td>
</tr>
<tr>
<td>Quaker Steak &amp; Lube Visit</td>
<td>12/5/09</td>
<td>Quaker Steak &amp; Lube Middleton, WI</td>
<td>Public</td>
<td>All Team Members</td>
</tr>
<tr>
<td>Snap-On Campus Visit</td>
<td>2/3/2010</td>
<td>Engineering Centers Building Madison, WI</td>
<td>Snap-On Employees</td>
<td>All Team Members</td>
</tr>
<tr>
<td>Hockey Classic Outdoor Tailgate</td>
<td>2/6/2010</td>
<td>Camp Randall Stadium Madison, WI</td>
<td>Public</td>
<td>Adam Richards, Kevin Olikara, Andrea Parins, Kevin Schneider, Brian Lee, George Guo, Stacey Ley</td>
</tr>
<tr>
<td>Middle School Shop Tour</td>
<td>2/13/2010</td>
<td>Engineering Centers Building Madison, WI</td>
<td>Youth</td>
<td>Kevin Olikara</td>
</tr>
<tr>
<td>Girl Scout Badge Day</td>
<td>2/202010</td>
<td>Engineering Hall Madison, WI</td>
<td>Youth</td>
<td>Stacey Ley, Brian Lee</td>
</tr>
<tr>
<td>Coveritlive Web Chat</td>
<td>2/25/2010</td>
<td>The Internet</td>
<td>Public</td>
<td>Zack Ward, Will O’Connor</td>
</tr>
<tr>
<td>High School Shop Tour</td>
<td>2/27/2010</td>
<td>Engineering Hall Madison, WI</td>
<td>Youth</td>
<td>Will O’Connor, Kevin Schneider</td>
</tr>
<tr>
<td>High School Shop Tour</td>
<td>3/12/2010</td>
<td>Engineering Hall Madison, WI</td>
<td>Youth</td>
<td>Will O’Connor, Kevin Schneider</td>
</tr>
<tr>
<td>Science Expeditions</td>
<td>4/10/2010</td>
<td>Linden Drive Madison, WI</td>
<td>Youth</td>
<td>Adam Richards, Kevin Olikara, Kevin Schneider, Jon Breen</td>
</tr>
</tbody>
</table>
1. Activity name: Hybridfest  
Date/Time: 7/18, 7/19/09, 2-day fair  
Location: Dane County Fair, Madison, WI  
Team participants: Glenn Bower, Adam Richards  
Audience: Public, Hybrid Enthusiasts  
Activity description/details: The team spoke to the general public, specifically people interested in hybrid vehicles. Attendees got advice on how to drive their own vehicles more efficiently, see new vehicles available to the consumer, hear speakers on alternative energy technology, and test drive hybrid vehicles available from Madison dealerships.  
Key Messages Covered: Hybrid technology, new vehicles  
Any measurable results: Attendance of over 2,000 people

2. Activity name: Girl Scout Badge Day  
Date/Time: 10/3/09, 11 a.m. – 2 p.m.  
Location: Engineering Hall, University of Wisconsin  
Team participants: Ray Uhen, Alex Viser  
Audience: Youth, 4th-6th grade  
Activity description/details: The team participated as one of three engineering and science “stations” at the Society of Women in Engineering’s Girl Scout Badge Day. The team helped the Girl Scouts complete activities to earn a science badge by demonstrating how hybrid vehicles work using a team vehicle as a model. The team also led a discussion on acids and bases.  
Key Messages Covered: science, acids and bases, hybrid technology  
Any measurable results: The team passed out surveys to the girls and the average score was 80% and 100 girls attended the event.

3. Activity name: University of Wisconsin Homecoming Parade  
Date/Time: 10/16/2010, 6 – 8 p.m.  
Location: Downtown Madison, WI  
Team participants: All Team Members  
Audience: Public  
Activity description/details: The team participated in the annual UW-Madison homecoming parade. The team participates in this event every year to increase team exposure to the non-engineering student body, alumni and the Madison
community. The newly received EcoCAR was driven behind other vehicle teams in the parade. Team members rode inside the EcoCAR and walked alongside handing out candy and water bottles to kids.

Key Messages Covered: School Spirit, visual exposure to the new EcoCAR

Any measurable results: A video posted on YouTube has 244 views and 3,000 people attend the parade annually.

4. Activity name: Snap-On Headquarters Visit
Date/Time: 11/6/2010, 12 – 5 p.m.
Location: Kenosha, WI
Team participants: Glenn Bower
Audience: Snap-On employees
Activity description/details: The EcoCAR was on display for the Snap-On Board of Directors Meeting as well as the Snap-On GreenWorks Energy Fair. The display featured the vehicle and posters detailing the EcoCAR competition and the team’s vehicle design plan.

Key Messages Covered: Vehicle architecture, EcoCAR Competition

Any measurable results: There were 400 employees that attended the fair.
5. Activity name: Girl Scout Badge Day  
Date/Time: 11/7/09, 11 a.m. – 2 p.m.  
Location: Engineering Hall, University of Wisconsin  
Team participants: Drew Kozmoski, Adam Richards  
Audience: Youth, 4th-6th grade  
Activity description/details: Identical to the event in October, the team participated as one of three engineering and science “stations” at the Society of Women in Engineering’s Girl Scout Badge Day. The team helped the Girl Scouts complete activities to earn a science badge by demonstrating how hybrid vehicles work using a team vehicle as a model. The team also led a discussion on acids and bases.  
Key Messages Covered: science, acids and bases, hybrid technology  
Any measurable results: The team passed out surveys to the girls and the average score was 83% and 100 girls attended the event.
6. Activity name: Paint Revelation at Quaker Steak & Lube
   Date/Time: 12/5/09, 11 a.m. – 3 p.m.
   Location: Quaker Steak & Lube, Middleton, WI
   Team participants: All Team Members
   Audience: Public
   Activity description/details: Team members displayed the EcoCAR to community members inside the motorsports-themed restaurant Quaker Steak & Lube. The restaurant was full of patrons during the afternoon and the team spoke one-on-one with customers about the vehicle’s design plan and revealed the new paint design by Kelly Moss Motorsports
   Key Messages Covered: Hybrid Technology, team design, paint revelation
   Any measurable results: Website traffic increased by 13 visits the following day
7. Activity name: Snap-On Campus Visit  
   Date/Time: 2/3/2010, 5 – 7 p.m.  
   Location: Engineering Centers Building, Madison, WI  
   Team participants: All Team Members  
   Audience: Snap-On Employees  
   Activity description/details: Team members welcomed two representatives from Snap-On who traveled from the office headquartered in Kenosha, Wisconsin to meet the team and tour the shop. Snap-On was very interested in learning about the vehicle design and offered their help to complete any future projects, further enhancing the team-sponsor relationship.  
   Key Messages Covered: Vehicle architecture  
   Any measurable results: No

8. Activity name: Hockey Classic Outdoor Tailgate  
   Date/Time: 2/6/2010, 12 – 4 p.m.  
   Location: Next to Camp Randall Stadium, Madison, WI  
   Team participants: Adam Richards, Kevin Olikara, Andrea Parins, Kevin Schneider, Brian Lee, George Guo, Stacey Ley  
   Audience: Public  
   Activity description/details: The EcoCAR was displayed behind the UW football stadium Camp Randall for the annual outdoor hockey classic that takes place inside the stadium. The team collaborated with the Society of Women in Engineering and the group of 15 students grilled burgers, handed out hot chocolate and showed off the EcoCAR to the public that passed by on the way to the game.  
   Key Messages Covered: School Spirit, visual exposure to the EcoCAR  
   Any measurable results: Bucky Wagon Blog posted about the event.
9. Activity name: Middle School Shop Tour
Date/Time: 2/13/2010, 2 -3 p.m.
Location: Engineering Centers Building, Madison, WI
Team participants: Kevin Olikara
Audience: Youth. 6th grade
Activity description/details: In collaboration with the Diversity Affairs Office, team members discussed engineering in a series program called Saturday Enrichment Program. The goal is to introduce minority middle school students to different educational activities to promote academic success. The team hosted a classroom discussion with 12 students covering engineering majors, skills and hybrid technology before entering the shop for a hands-on look at the EcoCAR.
Key Messages Covered: Engineering, math, science, hybrid vehicles
Any measurable results: The team passed out surveys to the students and the average score was 75%.
10. Activity name: Girl Scout Badge Day  
Date/Time: 2/20/09, 11 a.m. – 2 p.m.  
Location: Engineering Hall, University of Wisconsin  
Team participants: Stacey Ley  
Audience: Youth, 4th-6th grade  
Activity description/details: Like the previous two Girl Scout events, the team participated as one of three engineering and science "stations" at the Society of Women in Engineering’s Girl Scout Badge Day. The team helped the Girl Scouts complete activities to earn a science badge by demonstrating how hybrid vehicles work using a team vehicle as a model. The team also led a discussion on acids and bases.  
Key Messages Covered: science, acids and bases, hybrid technology  
Any measurable results: The team passed out surveys to the girls and the average score was 80% and 100 girls attended the event.

11. Activity name: Coveritlive Web Chat  
Date/Time: 2/25/2010, 2 – 3 p.m.
Location: The Internet, Madison, WI
Team participants: Zack Ward, Will O’Connor
Audience: Public
Activity description/details: Participating as a co-panelist along with NCSU, the team answered hybrid technology questions in a one-hour GM moderated web chat. Both teams shared the majority of the 29 questions asked by the public delivering informational and personable responses.
Key Messages Covered: vehicle architecture, EcoCAR competition
Any measurable results: Website traffic was the highest of the month with 36 visits.

12. Activity name: High School Shop Tour
Date/Time: 2/27/2010
Location: Engineering Centers Building, Madison, WI
Team participants: Will O’Connor, Kevin Schneider
Audience: Youth
Activity description/details: Eighteen high school students from Milwaukee, Wisconsin toured the shop on an Engineering field trip. Many of the students were interested in studying engineering in the future. The team showed the students the EcoCAR and explained the competition and other ways they could get involved in the project when they enter college.
Key Messages Covered: Engineering, math, science, hybrid vehicles
Any measurable results: The team did an oral survey at the end to recap and test comprehension.

13. Activity name: High School Shop Tour
Date/Time: 3/12/2010
Location: Engineering Centers Building, Madison, WI
Team participants: Will O’Connor, Kevin Schneider
Audience: Youth
Activity description/details: In collaboration with the Society of Hispanic Professional Engineers, the team welcomed 30 high school students interested in pursuing engineering in college. The goal of the program is to reach out to
Hispanic youth and inspire them to enter a future in engineering. They asked a lot of great questions about the vehicle and the university. 
Key Messages Covered: Engineering, math, science, hybrid vehicles
Any measurable results: The team did an oral survey at the end to recap and test comprehension

14. Activity name: Science Expeditions
Date/Time: 4/10/2010
Location: Microbial Sciences Building, Madison, WI
Team participants: Adam Richards, Kevin Olikara, Kevin Schneider, Jon Breen
Audience: Youth
Activity description/details: The team participated in Science Expeditions, an annual science fair for kids. As one of the “exploration stations” the team had a hands-on hybrid vehicle simulator. With a crank of the wheel acting as the energy source, the kids could feel the difference when they received help from an electric motor, simulating how hybrid vehicles work. The team also had a visible experiment on how to create ethanol by combining sugar, water, and yeast in a water bottle and watching a balloon placed at the mouth of the bottle expand. This engaged conversation in bio-fuels. Lastly, the team had its EcoCAR parked alongside the demonstrations to show how all the concepts fit together.
Key Messages Covered: Hybrid Vehicles, electric motors, parallel and series hybrids
Any measurable results: Website traffic increased 13 views from the day before. Organizers expected 2,000 people to attend the day-long event.
FOR IMMEDIATE RELEASE

DATE: 4/23/2010
CONTACT: Andrea Parins, parins@wisc.edu, (920) 327-0697

JOHNSON CONTROLS AND UW-MADISON TEAM UP FOR NATIONAL HYBRID VEHICLE COMPETITION

Anytime University of Wisconsin-Madison mechanical engineering student Brian Lee hit a blank while developing models for a battery mounting system to put into the university hybrid team's latest project, he knew exactly who to call anytime for help and advice: Johnson Controls in Milwaukee.

Lee, a sophomore and first-year team member, eagerly volunteered to design the battery mounts on the hybrid team's latest project to convert a General Motors hybrid car into a more efficient, consumer-friendly vehicle. Not knowing where to begin, Lee contacted Johnson Controls, which provided him with the necessary technical specifications and computer-aided design (CAD) files to begin the design process.

The power solutions company has been a crucial technical adviser for the team throughout the past decade. Glenn Bower, a UW-Madison mechanical engineering faculty associate and vehicle team advisor, actively sought a Johnson Controls system for this year’s vehicle competition, though the rest of the competition teams are using a different provider.

“Johnson Controls consistently provides our team with quality products, the latest technologies and great customer service,” says Bower. “I had no doubt that I wanted to use their battery in our competition hybrid vehicle and I feel very strongly that it will be a key component of our vehicle’s success.”

The hybrid vehicle team students have a rich history of success working with Johnson Controls. Dan Mehr, a UW-Madison alumnus and now a battery specialist at General Motors, designed packaging for the Johnson Controls battery in the team’s previous hybrid project for the Challenge X vehicle competition. The team's successful second-place finish made Bower and the students eager to work with Johnson Controls in the team’s current competition, EcoCAR, a three-year competition sponsored by GM and the U.S. Department of Energy that challenges 16 universities across North America to improve hybrid vehicle technologies.

The partnership isn't a one-way street. “Glenn and his team and Johnson Controls Power Solutions have enjoyed a mutually beneficial relationship through coordinating on the battery technology for the advanced vehicle that his team has produced for DOE competitions,” says Michael Andrew, director of Government Relations and Academic Partnerships at Johnson Controls. “Through that relationship, we’ve not only been able to showcase our technologies but we see firsthand the technical capabilities on campus, which creates a great avenue for Johnson Controls to recruit better engineers.”

Throughout this year, Johnson Controls has frequently provided detailed technical support to the students. After waiting almost two months for the battery to ship from Germany to Wisconsin, the team received its 300-pound battery pack in late January.
representative made a personal visit to the shop to make sure everything was working properly after the long shipment.

“It only took 15 minutes to set-up and the battery turned on right away,” says Adam Richards, an electrical engineering student and team leader. “It was by far the easiest thing that we've done with the vehicle so far.”

But it wasn't all easy after that. Getting such a large battery pack to fit within the constraints of the stock vehicle and competition regulations was a big design challenge for Lee. Using the specs and CAD files of the battery provide by Johnson Controls, Lee was able to begin his design model for the mounts and fabricate them before the battery even arrived.

However, like many engineering projects, things didn't go as planned the first time around. Lee realized that the bolts didn't fit in the holes in the aluminum tubing and the mounts didn't align with the designated attachment spots on the battery. So Lee went back to the computer, but this time added downloaded bolt files in his CAD design and later fabricated the holes more accurately with the proper equipment.

“I came into this project with zero experience and now I'm one of the few guys on the team that know CAD and FEA testing really well,” says Lee. "Even though our battery arrived a few short months ago, I was able to learn valuable design skills and prepare for it an entire semester before, and even with my mistake, I still was ahead of my deadline to fix it. That was only possible because Johnson Controls was available to help every step along the way."

The donated battery pack is a prototype and the only one on the continent. It is top of the line, using the latest technology in large-scale lithium ion battery capable of powering a car. It contains 12 Kw-hrs of energy, which means the GM-donated vehicle has 25 miles all-electric range and a life expectancy of more than 10 years. One of its most appealing features to the team is its liquid cooling system, which is safer and more efficient than traditional air-based cooling systems.

###
--Andrea Parins, parins@wisc.edu, (920) 327-0697
Hi Thomas,

I saw your piece today on Johnson Controls and wanted to let you know about a long-standing partnership the company has with a college hybrid vehicle team.

The students that make up the University of Wisconsin-Madison hybrid vehicle team are working around the clock to transform a hybrid vehicle into a more efficient, consumer-friendly product. They aren't doing it alone, though; Johnson Controls has been a team partner since 2001, and currently, the company is providing technical components and service to help the team succeed in EcoCAR, a national collegiate hybrid technology competition sponsored by General Motors and the U.S. Department of Energy.

The partnership between UW-Madison and Johnson Controls is a great example of academia and industry coming together to promote green innovation here in Wisconsin.

For more information about the partnership, please see the attached release and feel free to contact team advisor Glenn Bower at (608) 263-7252 or Michael Andrew at (414) 524-3229.

Thank you for your time,

Andrea Parins
D. Website

- Switched to a new host
- Added team and EcoCAR logo on top of website
- Eliminated old links to simplify look
- Created team biographies
- Added EcoCAR description page

E. Social Media

<table>
<thead>
<tr>
<th>Blog Site</th>
<th>Blog Post Type</th>
<th>Date/Time</th>
<th>Theme</th>
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<tbody>
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<td>Uwhybrid.org</td>
<td>Photo text</td>
<td>7/16/09, 3:39 p.m.</td>
<td>Hybridfest announcement</td>
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<td>Uwhybrid.org</td>
<td>Photo text</td>
<td>8/28/09, 7:13 p.m.</td>
<td>Updates for a new year of EcoCAR</td>
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<td>Uwhybrid.org</td>
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<td>9/2/09, 11:19 a.m.</td>
<td>Fall kick-off announcement</td>
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<td>Uwhybrid.org</td>
<td>Text</td>
<td>9/23/09, 8:14 p.m.</td>
<td>Article feature at Chevymusclecars.com</td>
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<td>Uwhybrid.org</td>
<td>Text</td>
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<td>Fall workshop announcement</td>
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<td>Uwhybrid.org</td>
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<td>9/29/09, 3:31 p.m.</td>
<td>EcoCAR design survey</td>
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<td>10/5/09, 3:31 p.m.</td>
<td>New proposed design theme</td>
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<td>Uwhybrid.org</td>
<td>Embedded YouTube Video</td>
<td>10/14/09, 11:12 a.m.</td>
<td>WI Channel 3 news report</td>
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<tr>
<td>Uwhybrid.org</td>
<td>Flip Video</td>
<td>10/20/09, 10:50 a.m.</td>
<td>Homecoming parade</td>
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<td>Uwhybrid.org</td>
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<td>11/18/09, 5:47 p.m.</td>
<td>Motor City Road Rally</td>
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<td>Uwhybrid.org</td>
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<td>11/18/09, 5:55 p.m.</td>
<td>Naperville Sun article announcement</td>
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<td>Uwhybrid.org</td>
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<td>11/18/09, 6:05 p.m.</td>
<td>River Falls Journal announcement</td>
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<td>Uwhybrid.org</td>
<td>Embedded YouTube Video</td>
<td>11/30/09, 12:12 p.m.</td>
<td>NBC Channel 15 News report</td>
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<td>Uwhybrid.org</td>
<td>Flip Video, Photo text</td>
<td>12/2/09, 12:44 p.m.</td>
<td>EcoCAR Teardown video and paint preparation</td>
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<td>Uwhybrid.org</td>
<td>Photo text</td>
<td>12/2/09, 1:12 p.m.</td>
<td>EcoCAR to visit Quaker Steak and Lube</td>
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<td>Green Garage Blog</td>
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<td>Wisconsin receives its EcoCAR</td>
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<td>EcoCAR new paint design in 360 degrees</td>
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<td>EcoCAR endures the cold at Hockey Classic tailgate</td>
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YouTube:

- Videos: 10
- Total Views: 1,037
Appendix: Copies of Media Clips

We usually do not post about non muscle cars at Chevy Muscle Cars, but here is an exception. I want to bring your attention to the EcoCAR project, and specifically Wisconsin’s participation with the project. The EcoCAR Challenge is a three-year competition that builds on the 19-year history of Department of Energy’s advanced vehicle technology competitions by giving engineering students the chance to design and build advanced vehicles that demonstrate leading edge automotive technologies. Wisconsin’s work hopes to create a practical road hybrid based off of GM’s Saturn Vue with innovation and engineering. The University of Wisconsin-Madison car’s battery pack’s fuel source is a 45 Amp/hr liquid cooled KCS battery pack. This large capacity pack is designed primarily to get 30+ miles per charge during plug-in mode. Wisconsin has chosen L85 as a fuel source for the EcoCAR competition to run in the 2015 V8 Weber Engine.
University of Wisconsin-Madison engineering students will receive a GM-donated car Tuesday, Oct. 6, and will begin converting it into an extended-range parallel hybrid vehicle. The students are participating in the GM- and U.S. Department of Energy-sponsored competition called EcoCAR, which challenges 17 North American universities to reduce fuel consumption and greenhouse gas emissions in a vehicle during the next two years.

The EcoCAR team is one of six vehicle projects at UW-Madison and is the latest in a long line of hybrid vehicle projects. Under the mentorship of mechanical engineering faculty associate Glenn Bower, the students will increase the efficiency of a hybrid SUV to operate totally on electric power for a range of more than 20 miles. When the battery pack gets low, a small engine burning E85 ethanol will kick in. The vehicle could be more efficient than current hybrids on the market because it would handle both in-city and highway speeds without using regular petroleum.

Electrical and computer engineering student Adam Richards, who is the hybrid team leader, says the experience of participating in the EcoCAR competition is valuable for students. "We're learning how to actually design and build hybrid electric vehicles, which will be really important for those of us looking to work in the automotive industry," Richards says. "Lectures in class are great, but I really like to be able to work on a useful project that you can actually see driving down the road."

Media are invited to tour the team shop and see the car on Wednesday, Oct. 7, at the Engineering Centers Building, 1550 Engineering Drive. Contact Richards at 608-408-0664 to set up an appointment with team members, who can answer questions about the vehicle and their plans for the EcoCAR competition. For more information about the UW-Madison vehicle teams, visit http://www.vehicles.wisc.edu/.

CONTACT: Glenn Bower, 608-263-7252, grbower@facstaff.wisc.edu; Adam Richards, 608-408-0664, arichards2@wisc.edu
The Badgers are coming.

"If you're interested in working in the field of climate science, this is a great opportunity. Join us at the Climate Science Conference this weekend to learn more. More information is available at http://climate-wisconsin.edu."
Waubonsie grad leads hybrid team at University of Wisconsin-Madison

October 25, 2009

University of Wisconsin-Madison engineering students — including Waubonsie Valley High School graduate Adam Richards — recently received a GM-donated car to convert into an extended-range parallel hybrid vehicle.

The students are participating in a GM- and U.S. Department of Energy-sponsored competition called EcoCAR, which challenges 17 North American universities to reduce fuel consumption and greenhouse gas emissions in a vehicle during the next two years.

Richards, who is the hybrid team leader, said the experience of participating in the EcoCAR competition is valuable for students.

"We're learning how to actually design and build hybrid electric vehicles, which will be really important for those of us looking to work in the automotive industry," he said. "Lectures in class are great, but I really like to be able to work on a useful project that you can actually see driving down the road."

The EcoCAR team is one of six vehicle projects at UW-Madison and is the latest in a long line of hybrid vehicle projects. Under the mentorship of mechanical engineering faculty associate Glenn Bower, the students will increase the efficiency of a hybrid SUV to operate totally on electric power for a range of more than 20 miles. When the battery pack gets low, a small engine burning E85 ethanol will kick in.

The vehicle could be more efficient than current hybrids on the market because it would handle both in-city and highway speeds without using regular petroleum.

Visit www.vehicle.uwm.edu.

— Submitted by University of Wisconsin-Madison
Detroit rally launches UW-Madison vehicle team endowment

Oct. 30, 2009 by Sandra Knisely

Hauling five vehicles and eight people more than 400 miles is no simple feat, but when it comes to all things automotive, University of Wisconsin-Madison faculty and students will do whatever it takes.

A group of engineering students from the UW-Madison vehicle teams, led by mechanical engineering faculty associate Glenn Bower, headed to Detroit on Oct. 24 for the first-ever Motor City Badgers’ Road Trip Rally. The event aimed to inspire both the students visiting Detroit and the automotive industry members who met with the engineering talent of the future.

The Detroit chapter of the Wisconsin Alumni Association organized and hosted the event and launched a three-year $10 million endowment campaign. The endowment will take UW-Madison vehicle teams to the next level and ensure UW-Madison remains a source of innovative, well-trained engineers to the automotive industry for generations to come.

The vehicle teams have a strong record of success. Most recently, the two snowmobile teams, one a zero-emissions sled and the other an internal-combustion sled, won their respective categories in the 2009 Society of Automotive Engineers (SAE) Clean Snowmobile Challenge. In 2007, the Formula SAE team claimed the world championship. Coupled with the Baja SAE team and the Hybrid Vehicle team, which is currently participating in the GM- and U.S. Department of Energy-sponsored EcoCAR competition, UW-Madison has been victorious at 16 different international automotive competitions since 1998.

These accomplishments translate into benefits on the east side of Lake Michigan, as hundreds of former vehicle team participants go on to work for the automotive industry — which is exactly the point, says Bower. Under Bower’s mentorship during the past 15 years, the teams have produced more than 1,500 graduates with real world, hands-on experience in innovative vehicle design and development.

"We are trying to supply the industry with engineers who have a good background working with auto projects," Bower said in a recent issue of the UW-Madison alumni publication On Wisconsin. "We can supply the companies with plug-and-play engineers; they don’t have to train them for two years. These engineers have the skills ahead of time that allow them to become productive very quickly."

The mutual relationship between UW-Madison and Southeastern Michigan is why the Motor City Badgers decided to host the Road Trip Rally, says chapter president Mark Polster, a sustainability, environment and safety engineer at Ford.

"The Road Trip Rally raised awareness of the vehicle programs in the Motor City among alumni, original equipment manufacturers, suppliers, aftermarket providers and racing companies, and in turn promoted the automotive industry and Southeastern Michigan on the UW-Madison campus," Polster says.

The event offered attendees the chance to test drive the UW-Madison Baja vehicle, Formula hybrid car, electric snowmobile and electric test car around dozens of cones arranged in the Ford plant parking lot. After the Ride ‘n’ Drive, a group of almost 70 toured the Roush Automotive Collection in Livonia, Mich., and students and alumni enjoyed viewing the extensive collection of classic cars, sports cars and racing vehicles, including the 2003 NASCAR Winston Cup-winning stock car driven by Wisconsin native Matt Kenseth.

Several speakers addressed the crowd, including mechanical engineering student and Formula team member Gianluca Mantovano, who talked about the importance of his experiences with the vehicle teams.

"The vehicle teams’ record and facilities actually helped me decide to attend UW-Madison. Right away my freshman year I joined the Formula team, which has fueled my fire in terms of continuing my automotive education," he says. "I wouldn’t be where I am today without these teams."

For more information about the UW-Madison vehicle teams and how to get involved with the endowment, visit http://vehicles.wisc.edu.
Detroit rally launches UW-Madison vehicle team endowment

Hauling five vehicles and eight people more than 400 miles is no simple feat, but when it comes to all things automotive, University of Wisconsin-Madison faculty and students will do whatever it takes.

HAULING FIVE VEHICLES and eight people more than 400 miles is no simple feat, but when it comes to all things automotive, University of Wisconsin-Madison faculty and students will do whatever it takes.
Local student works on driving into the future

According to Zack Ward of River Falls, the auto industry and the United States need to push for better fuel economy.

By: Vera Roy-Steebo, River Falls Journal

According to Zack Ward of River Falls, the auto industry and the United States need to push for better fuel economy.

As a means to that end, Ward and about 40 of his engineering school teammates at UW-Madison are taking part in a three-year competition called "EcoCAR."

In early October the team received a GM-donated car with the goal of converting it into an extended-range parallel hybrid vehicle. The students are taking part in the GM- and U.S. Department of Energy-sponsored challenge, where 17 North American will work at reducing fuel consumption and greenhouse gas emissions during the next two years.

"I believe the auto industry needs to push for better fuel economy and that America will be pushing for better fuel economy the more the price of gas rises and become instable," began Ward, when asked the importance of the university's project. "Using less oil is good for both our country and the environment. Hybrid vehicles are a great way to save gas, especially in city driving environments where hybrid technologies optimize the use of energy."

"As we further develop hybrid vehicle technology, fuel economy will go up and emissions will go down, as will the cost of these vehicles."

Ward, the son of Michael and Sally Ward of River Falls, hopes to graduate in May 2010. He's now working on a bachelor's degree in mechanical engineering and a technical communication certificate.

Ward learned about the competition after reading a poster displayed on the engineering part of the campus.

He decided to take part in the challenge because, "I believe the personal transportation industry is one that has a lot of potential for change. I wanted to learn more about what goes into building hybrid vehicles."

"It is a fun and challenging project involving the coordination of many people with many different skills."

Ward says he's considered a "key member" of the team, mainly because of his upperclassman status.

"I'm one of the dozen or so more active members on the team," Ward explained. "We (the key members) take on larger tasks or more critical tasks within the team, and have weekly meetings, and sometimes help run the team meetings. I work mostly with the mechanical and controls groups within the team."

The completion of the challenge will not be overnight, according to Ward.

"I will be spending hundreds of hours over the course of the year working on the vehicle, attending meetings, etc., as many of the key members will. We have many other members who spend a few hours here and there when they have time. The group is very flexible."

Ward was also asked when the hybrid vehicle project will be completed.

"Completed is a relative term in our competition," said Ward, noting the three years that will be invested in the vehicle.

"The first year is a design year. We design and model vehicle changes and simulate the performance of the vehicle. The second year, the year we are in now, we get our donated vehicles from GM, put in our new components, and get the vehicle in driving condition.

"The third year is for improving our vehicle and making it 99% production ready. This means no odd buttons in the cab of the vehicle, the car should drive like a normal car, etc."

On May 27, 2010, the year-two results will be released, says Ward.

As a result of the competition, Ward hopes to learn the intricate knowledge and skills of hybrid design, testing and development.

"I would love the chance to work for a company like Tesla Motors, a new electric vehicle company in the Silicon Valley, or possibly become a consultant on hybrid vehicle development."

The ambitious young man says after graduation he will probably move to a city where he can, "...get a job in a field related to energy, most likely alternative fuel vehicles or green buildings, and embark on another new and exciting experience."

He still has his heart in River Falls, however.

"I hope to return to the River Falls/Greater Twin Cities area within the next 10 years and start a family."

To learn more about the EcoCAR challenge, Ward suggested interested readers go to: www.ecocarchallenge.org or www.uwhybrid.org.

Tags: ecoCAR challenge, auto industry, river falls, local news, fuel economy, uw madison, education, ecology
Middleton native to help develop ecocar hybrid

In early October, a team of University of Wisconsin-Madison engineering students, Middleton native Adam Strutz included, received a GM-donated car. Strutz and the team will soon convert it into an extended-range parallel hybrid vehicle. The students are participating in the GM- and U.S. Department of Energy-sponsored competition called EcoCAR, which challenges 17 North American universities to reduce fuel consumption and greenhouse gas emissions in a vehicle during the next two years. The UW-Madison EcoCAR team will present its completed hybrid in May to GM and associates. For more information about the team and competition, visit www.uwhybrid.org.
the case against Curtis Forbes, Columbia County Circuit Court Judge Alan J. White said this week that a jury chosen from people living outside Columbia County would be more objective if the case goes to trial.

Forbes, 52, faces life in prison if convicted.

The vehicle teams are a UW-Madison College of Engineering program in which students work on projects to build different types of vehicles. Some of the team's past projects include a zero-emissions snowmobile and a hybrid EcoCar.

Since 1998, UW-Madison vehicle teams have won 16 international automotive competitions.

According to Mark Polster, president of the Detroit chapter, they decided to host the rally after finding out funding for many campus programs was being cut. He said the group felt Detroit would be a great location because of the city's ties to the automotive industry.

"We wanted a way to keep those programs alive," Polster said. "These programs are world-class programs. It sets UW apart from other universities!"

Although Polster is optimistic about the campaign's success, he said the vehicle teams program could be cut in the future if the group cannot raise enough money.

"People don’t know how important these programs are to developing not just automotive engineers but engineers in general," Polster said. "When these students graduate they're years ahead of other students."

UW-Eau Claire

Nineteen students attending the University of Wisconsin-Eau Claire received a Blugold Fellowship for the 2009-10 academic year. Middleton's Adam Schneider, a Middleton High School graduate, was among those receiving the distinction.

Concordia University

Monica Enderlin, a resident of Middleton, has been admitted to Concordia University, St. Paul for the fall 2010 semester. Enderlin was awarded the President's scholarship. This achievement provides a total of $8000 in funds.

Concordia University, St. Paul is a comprehensive, private university of the Lutheran Church-Missouri Synod and one of 10 schools that comprise the Concordia University System.

UW-Madison

Middleton native and University of Wisconsin-Madison student Adam Strutz was one of a dozen engineering students from the university's vehicle teams to attend the first-ever Motor City Badgers' Road Trip Rally on Oct. 24. Held at the Roush Automotive Collection in Livonia, Mich., and hosted by the Detroit chapter of the Wisconsin Alumni Association, the event launched a fund raising effort to endow the UW-Madison teams.
This weekend, the Bucky Wagon and vehicle team members are headed to Quaker Steak & Lube in Middleton, Wisconsin. The students will fill up on some chicken wings and talk with the public about their hybrid technology projects, including the Bucky Wagon and the EcoCAR. See below for more info. We hope to see you there!


UW-MADISON HYBRID TEAM TO SHOWCASE VEHICLES AT QUAKER STEAK AND LUBE

What better way to get ready to watch the Badgers take on Hawaii than chicken wings and the Bucky Wagon?

The University of Wisconsin–Madison hybrid vehicle team will be on hand at motorsports–themed Middleton restaurant Quaker Steak & Lube Saturday, Dec. 5 from 11–3 p.m. to showcase two hybrid vehicle projects, the Bucky Wagon and the EcoCAR. Bring your hybrid questions and interact with faculty and students while surveying the vehicles.

The Bucky Wagon is an iconic UW–Madison symbol that carries Badger spirit across campus and throughout Madison on football Saturdays and for each year’s Homecoming festivities and parade. It is currently in transition to the 21st century as a safe, electric–powered vehicle with power hydraulic brakes and power steering.

The EcoCAR project is part of a General Motors and U.S. Department of Energy–sponsored competition, which challenges 17 North American universities to reduce fuel consumption and greenhouse gas emissions. Over the next two years, the team will engineer a hybrid SUV to a plug–in hybrid capable of 20 miles of electric range before the engine is turned–on allowing longer trips on conventional fuels.

"This event will be a good opportunity for community members to learn about our vehicle team program and how they can get involved, as well as talk with our students about the importance of hybrid technologies in general," Bower says.

"We’re excited to do this at Quaker Steak & Lube because we’ve had a relationship with the restaurant for years–they currently have three of our past vehicles which would have otherwise been dismantled hanging from their ceiling. We think this is pretty amazing!"

Media and the public are invited to join the UW hybrid team at Quaker Steak and Lube, 2259 Deming Way, Middleton. For more information about the UW–Madison vehicle teams contact team leader Adam Richards, (608) 408–0664, advisor Glenn Bower, (608) 263–7252, or visit http://www.vehicles.wisc.edu/.
University of Wisconsin–Madison engineering student Adam Richards — a former Dellona resident — is leading a team of students in competition with 17 North American universities to convert a Saturn Vue into a more environmentally friendly vehicle.

The name of the three-year competition is the EcoCar Challenge, and a major sponsor is General Motors, which is supplying the vehicle.

This year’s competition takes place in Yuma, Ariz at the GM Proving Grounds from May 17 to 27, and the UW–Madison team will be defending a long record of high finishes from a variety of past competitions. In an interview by e-mail, Richards said most of the vehicles scored first place or in the best five dating back to 1992.

This year presents the team with its first opportunity to physically alter the Saturn Vue after working on its design through computer models last year, according to Richards.

The EcoCar Challenge spans three years. At the end of May 2011 the team will have developed an electrically powered vehicle nearly ready to show to consumers.

Richards explained what the UW–Madison team will be doing to the car: "This year we will be creating a fully electric plug-in hybrid for the first time at Wisconsin. In the past we have always had an engine as the main power source, but this year an electric motor will take its place. We are also using a small engine on board for an additional supply of electricity when the battery pack gets low. In the past our engines have run on biodiesel, but this year we will be using a turbocharged E85 engine that propelled the UW Clean Snowmobile team to first place at their competition last year."

Richards is excited to convert the plans they have on computer into something tangible and be working on a car that is "in the shop."

"It is much more interesting to actually see the technology in use and be able to drive around to test your ideas," he said. "We are using the same car for all three years of competition, but there are always ways to refine our designs, so we are always excited about incorporating something new."

As hybrid vehicle team leader, Richards oversees the work of three groups: electrical/controls, mechanical and the business/outreach teams. He handles the budget and makes sure the teams have assignments that will be completed on time.

Richards said the vehicle they are adapting is modeled after features from a combination of vehicles already on the market.

"This vehicle takes its plug-in/range extended mode from the Chevy Volt and its highway use is similar to how a Ford Escape works where the engine works to power the car at higher speeds. This design is very unique,"
especially since we will be incorporating a 750cc Turbo Charged Weber Engine from the snowmobile team, and we are hoping that we can optimize our emissions and fuel economy as much as possible to beat the competition," Richards said.

The auto industry is progressing fast to develop more environmentally friendly vehicles, Richards said. But the typical buyer is not prepared to part with the money that can be saved by buying cheaper gasoline powered cars, he added.

"The way to make up that gap is to perform more engineering research to create vehicles for all purposes that are both efficient and as powerful as the engines running today.

"Another major concern of the auto industry is safety. We are integrating new components into these hybrid cars but must make sure they can be as safe to the passengers as possible during a collision or other rescue situation," he said.

Richards is slated to graduate in May 2011. He guessed he would do well in engineering based on his curiosity for how toys were put together as a child.

"I have always been the kid who was more interested in how a toy worked rather than playing with it, so engineering was a perfect fit for me. Computers and electronics interested me the most, but I really like to see the line where the electronics actually work to power a device...gears or wheels or whatever. After I graduate I would like to work for one of the auto manufacturers doing design and research or possibly for one of the major suppliers to these automakers."

The team has a Web site at uwhybrid.org.
Thanks to all those who joined us last Saturday. Below is a recap of the event from EcoCAR outreach coordinator and life sciences communication student Andrea Parins.

The UW Hybrid Vehicle Team displayed three vehicles at Quaker Steak and Lube in Middleton, Wisconsin, Dec. 6 to give community members an up close and personal look at the team’s current projects. A dozen team members stood proudly next to the Bucky Wagon, the EcoCAR and the EV1 vehicle.

As the restaurant filled to capacity over the afternoon lunch hours, around 25 patrons spoke with engineering students about the team’s vehicles and took a glimpse under the hood. The Bucky Wagon, which was parked outside the front door for everyone to pass on their way in and out, was a crowd favorite. Badger fans of all ages stopped to admire the iconic vehicle.

“The older fans are especially excited for the electric conversion because they remember the awful black smoke seen behind the Bucky Wagon as it drove around the stadium,” says mechanical engineering student Stacey Ley.

The Bucky Wagon was also a kid favorite at the event. The team was excited to show off its vehicle projects to interested community members as they watched children climb up and pretend to drive the Bucky Wagon.

Inside the restaurant, the team displayed the EV1 vehicle and the EcoCAR, which was sporting a fresh paint job from the Kelly Moss Motorsports shop. Hybrid team leader and electrical and computer engineering student Adam Richards says the entire team is excited about the way the vehicle turned out and was very proud to showcase it along with the Bucky Wagon at Quaker Steak and Lube.
Meyer pushes mileage envelope on UW hybrid team

Rick Miller
Associate Editor

In our last episode on Milton’s Chris Meyer, currently a graduate engineering student at the University of Wisconsin, he and fellow engineering student Mike Deau had developed a working prototype of the EcoStream, a computerized, earth-friendly beverage dispensing machine that does away with plastic bottles.

But for those curious about cutting-edge automotive technology, reducing dependency on foreign oil and lowering vehicular carbon emissions, Meyer’s role as a member of the UW’s hybrid vehicle team is a more fascinating chapter. The team is currently in the midst of a three-year competition known as the EcoCAR Challenge.

The U.S. Department of Energy (DOE) has been organizing advanced vehicle technology competitions through the Argonne National Laboratory—its research and development facility—for 19 years. Other projects and

Hybrid vehicle team members look over the undercarriage of a donated Saturn Vue in their shop, located in the University of Wisconsin engineering building. The SUV is undergoing major modifications in order to accommodate a new drive train designed for the EcoCAR competition. Photo by Rick Miller
Competitions of UW engineering students have included designing eco-friendly formula racers and a zero-emission snowmobile, so successful in its design that it's being considered as transportation for researchers in Greenland.

In yet another transportation competition, students design and manufacture a prototype single-seat, off-road vehicle with about 10 horsepower. At the end of the year it goes up against entries from over 100 schools, races in a four-hour endurance event and is judged by professional engineers.

Meyer spent time as a teenager racing and working on motocross (off-road) motorcycles in the area, so it was no surprise he joined the school's baja team as a freshman.

"It fit with my background racing dirt bikes then, so I was hooked," Meyer said.

After that introduction to vehicle research and development, Meyer migrated to the hybrid vehicle team. When not absorbed in EcoCAR Challenge tasks, he spends a lot of time in the school of engineering’s Engine Research Center working on his master’s degree in mechanical engineering, specializing in low temperature diesel combustion. By the time he graduates from the UW this spring he will have spent five years on the hybrid vehicle team.

Engineering professor Glenn Bower is the faculty advisor for the hybrid vehicle team. He started building hybrid vehicles at the UW in 1992.

"This was well before fuel efficiency was even in the American mind-set, or something you considered when you purchased a vehicle," Meyer noted.

Besides the involvement of the DOE in the EcoCAR Challenge and support from Argonne Lab engineers, General Motors (GM) is another primary sponsor of the competition and supplies near-production ready vehicles to the teams at no cost. EcoCAR Challenge teams received 2009 Saturn Vue sport utility vehicles last year.

Other sponsors include the California Air Resources Board, the Environmental Protection Agency (EPA), the Canadian government, the National Science Foundation and Kenosha-based Snap-On Tools.

The DOE states the purpose of the EcoCAR Challenge is for teams of engineering students from 17 universities to design and build vehicles "that demonstrates leading-edge automotive
It is essential to design and build vehicles that demonstrate leading-edge automotive technologies, with the goal of minimizing the environmental impact of personal transportation and illustrating pathways to a sustainable transportation future.

Put another way, the contest gives students the opportunity to take a brand-new car, remove its entire drive train, and see if the bits, pieces and systems they screw back in will net incremental improvements in emissions and fuel use while also maintaining the ability to drive around in a fairly normal fashion.

Regardless of where a team finishes, the EcoCAR competition is considered a win on multiple levels. The project vehicles demonstrate the potential of advanced technologies to reduce fuel consumption; provide hands-on, real-world engineering and research experiences for students; and develop those students into highly skilled engineers with a deep understanding of advanced vehicle technology and development.

One thing Meyers and his teammates have learned about is the growing need for engineers with experience in "mechatronics," or mechanical and electronic controls.

"It's a blend between mechanical engineering and electrical engineering," Bower said in a recent WMVT interview. "The students that cross over and learn something about the other discipline are actually the ones that are sought out the most by industry."

Meyer explained further that as hybrid technology has progressed into mainstream areas of automotive technology, research and development time is spent "chasing down 1 to 2 percent gains to save fuel."

"A major innovation like shutting off the engine at a stop light turns into the question of how early can we stop the engine without impacting vehicle performance, and how do we predict this to maximize fuel savings?" Meyer said, "These areas are where mechatronics and controls development play a major role in these advanced vehicles, so there is tremendous opportunity for students to get involved."

As the academics have noted, hybrid vehicles have come a long way. These days everyone knows what a Toyota Prius is, and much has been written about the highly anticipated 2011 Chevy Volt, set to launch in November. In terms of drive trains, the two vehicles are very different, but both depend heavily on mechatronics.

A Prius is a genuine hybrid, gas/electric vehicle (HEV) in that it has both an electric motor and gas engine providing power to the wheels to move it. Power from the gas engine can go either to charge the batteries or drive the wheels depending upon demand, load, etc.

GM's Volt is an extended range electric vehicle (EREV). It has an all-electric drive train, and the onboard gas engine is for the generator only--it does not connect to the wheels (just like a diesel train locomotive). The Volt will travel up to 40 miles on battery juice alone, but with the small gas engine turning the generator its range extends up to 440 miles.

The hybrid team's Saturn Vue (or what's left of it) is also an EREV, but in true experimental fashion, Meyer and his teammates are going about things in a very different way. The UW EcoCAR is being fitted with not one, not two but three power plants. Up front is an electric motor from a GM EV1 electric car and a turbocharged, 750cc Weber snowmobile engine. Another electric motor is in a rear drive axle assembly. Or at least it will be once the students design and create a new, rear subframe to mount it (the subframe was on the team's "to-do" list for this week).

Unlike the Volt, the on-board Weber gas engine will be coupled to the front drive axles. Meyer explained that when the car is under light load and traveling above 45 mph, which is when gasoline engines are most efficient, the Weber will be driving the front wheels. Below 45 the
Although a car under 10,000 lbs does not exceed 50 mph, where gasoline engines are most efficient, the Weber will be driving the front wheels. Below 45 mph, the engine turns off and the EV1 motor will turn the front wheels.

But when the 300-volt, lithium-ion battery in their EcoCAR is low, the rear electric drive axle turns the rear wheels, and the Weber/EV1 run as a generator to recharge the battery, until the vehicle again hits a 45 mph, light load situation.

"At this point we again transition back into our parallel operating mode," Meyer explained, "with the Weber engine as a primary drive. This time however, we use full power out of the Weber engine and then use the EV1 motor to absorb excess power to recharge the battery, so the vehicle is propelled by the Weber engine and the battery is recharged when there is excess power available to divert to the battery."

A more complete explanation of their EcoCAR's drive train modes would take more column inches than are available here, but suffice it to say that there is some major mechatronics happening in this sucker. Logic suggests that if the front and rear motors of your car start pulling in opposite directions simultaneously, gas mileage really takes a nosedive.

Team expectations however, are running high. Mayer acknowledged that UW's EcoCAR is "a significantly more expensive/complex vehicle" than what competitors may bring to the table. He said the upside is that the UW hybrid should easily hit performance and fuel mileage targets.

Competition engineers are looking for 27 to 38 miles-per-gallon on a city driving cycle, and 37 to 57 mpg on the highway. Design parameters also call for such mileage to be realized without sacrificing too much acceleration or passenger and luggage capacity. Meyer said their vehicle should post quicker 0-60 and 50-70 mph times than a stock Saturn Vue.

The foremost question of Meyer's parents however, is probably not about gas mileage or acceleration, but whether all this fun with wrenches and computers will help their son find a job.

"My hybrid vehicle team time and experience enabled me to obtain my graduate student position at the Engine Research Center," Meyer said. "So I would say it's certainly given me some direction."

Continued Meyer, "I'm hoping to take my talents earned on the vehicle teams and at the Engine Research Center and apply them to a career in research and development, so while I'm not seeking a career in vehicle development now, I don't see those paths as mutually exclusive into the future."

A snag is that the recession has forced many U.S. firms to cut research and development budgets. But even with auto sales in the dumper last year, American consumers still bought 250,415 hybrids, and an upward trend is expected.

Know anyone with mechatronics and controls experience?
WHAT A VUE
The Hybrid Vehicle Team keeps UW-Madison’s reputation of groundbreaking research alive with its fuel efficient car.

It’s been a long, stressful week packed full of midterms and papers. As you stumble home Friday after class, all you can think about is how good your pillow will feel on your tired face when you fall into bed for an afternoon nap. But while you and many other UW-Madison students are off to sleep the daylight away, members of the Wisconsin Hybrid Vehicle Team are just reporting for duty at the Engineering Centers Building. Their goal? To develop a hybrid car that could benefit all of humanity. Does this make you feel lazy? Join the club!

The Wisconsin Hybrid Vehicle Team is a student organization that works to develop and improve techniques to make the world’s vehicles more efficient and less harmful to the environment. The team consists of nearly 60 members from all disciplines in the college of engineering.

Since 1992, the Hybrid Vehicle Team has participated in a national competition called the EcoCAR challenge. The EcoCAR challenge is a three-year engineering competition in which collegiate teams from all across the country design advanced vehicle propulsion systems that focus on alternative energy methods. The teams then implement their systems in vehicles donated by General Motors. Despite tough competition from across the country, UW-Madison has experienced great success in the past. The last competition, called the Challenge X, wrapped up in June 2008. UW-Madison’s vehicle finished second out of seventeen teams.

Their goal? To develop a hybrid car that could benefit all of humanity.

The current EcoCAR competition is titled the NeXt Challenge. The Hybrid Team is currently in year two of this competition. The first year involved theoretical development, in which math-based computer systems were employed to test ideas flushed out by the team. Now in year two of the NeXt voyage, the team has just received the 2009 Saturn Vue they will be modifying. According to assistant team leader Adam Strutz, the next step will be to disassemble and revamp the entire power train.

“arly this past month by working on the car, you can start to see your work paying off firsthand, not just on a computer screen,” Strutz says.

All the materials utilized by the team—including the car—do not just appear out of thin air. The major sponsors for the competition include the US Department of Energy, the Government of Canada, the

The hybrid team will make use of a two-cylinder engine borrowed from the UW-Madison clean snowmobile team that runs on E-85.
California Air Resources Board and General Motors (GM). General Motors donates a vehicle (this year it's the Saturn Vue) to each of the 17 teams competing across the 49th state, and the teams are also allotted $16,000 worth of parts courtesy of GM to work into their respective vehicles.

One benefit for both GM and Hybrid Team members is that GM looks at participants for future employment. Hybrid members already know about GM's software and components, thus GM is able to hire them and expect a contributing employee almost immediately. However, the team members make it clear that their employment is just an added bonus. The real fulfillment is getting to apply what they have learned in the classroom to real world situations. Members must rely on their own investigation and analysis to acquire knowledge, rather than relying on the pages of a textbook.

While many student groups may meet for only an hour or two per week, the Hybrid Vehicle Team is a much more substantial commitment. Adam Richards, the team leader, explains that the team has small group meetings throughout the week for the three different areas of the competition: controls, business and mechanical. Full team meetings take place on Fridays. It's during this time that actual work is completed on the car. The meetings start at 3:30 p.m. and can extend into the wee hours of the morning. In the team office there is a board with members' names on it. Under each name lie tallies for the number of all-nighters the member has completed.

"If we have a report that is due the next day by noon, members are staying there all night to make sure it gets done. Writing reports of our testing would probably be the least favorite part of the group activities," Richards says. "The most rewarding part of development is when you've done all the testing on the computer, written the reports, and you're able to implement your ideas into the actual vehicle and see it work, all of the hard work paying off."

With all the long hours the team spends together, strong friendships form. Zack Ward, a member of the mechanical group, says that members often get together outside of meetings to have a cold, refreshing beverage and enjoy a Badger football game.

As the team continues work on the Saturn Vue this semester, all members look excitedly to the month of May. The competition will be held in Yuma, Arizona this year at GM's new proving ground. At the competition, the team will be evaluated on 0-60 mph acceleration time, emissions, drive quality and new this year, towing events.

As the team develops the vehicle throughout the year, they must meet the reduced emissions goal, while maintaining the vehicles' performance and consumer appeal. "One of the challenges we face is packaging, fitting everything into the space allotted. No one wants a huge battery pack sitting in the back of their vehicle," Strutz says.

To meet the many goals of the competition, the team must show dedication, but also resourcefulness. The team exemplified this inventiveness in the last competition two years ago when they took over the Kohl Center. This arena is known for housing some epic battles on the ice rink, but the Hybrid Vehicle Team saw the sheet of ice as a great place to test their traction control systems in preparation for the competition.

As UW-Madison is a major hub for groundbreaking research, it seems fitting that there is such a focus on alternative energy methods on campus. So if you meet a member of the Hybrid Vehicle Team tell them thank you, because you know they are working to preserve the planet we call home. And best of all? They have fun doing it. WP

Article by Ben Weight
Design by David Jones
This weekend is the much-anticipated Camp Randall Hockey Classic (the super-cool outdoor exhibition at Camp Randall). On Saturday, February 6, the Badger women’s team faces the Bemidji State Beavers at 2:00 and the men’s team takes on the Michigan Wolverines at 5:00. Before or in between games come by the south entrance of the Engineering Centers Building (1550 Engineering Drive) for hot chocolate served by members of the UW-Madison vehicle teams. Students will be serving from 1:00-5:00.

The Bucky Wagon will be on site for its final public appearance until spring. After Saturday, the vehicle will be in the shop for the beginning of intense renovation efforts. When the Bucky Wagon emerges in May, it will have a new axle and motor, as well as a restored body.

So come out Saturday and celebrate with the vehicle team–go Badgers and go Bucky Wagon!