Press Conference

State Capitol
Lansing, MI

May 24, 1999 ❑ 8:45 AM

S P E A K E R S

Dan Wyant, Master of Ceremonies
Director, MI Department of Agriculture

Lt. Governor Dick Posthumus
State of Michigan (invited)

John Ferrell
Director, Office of BioFuels Development, U.S. Department of Energy

Kathy Wilbur
Director , MI Department of Consumer & Industry Services

Ed Koerner
Executive Director Chassis/Powertrain/HVAC/PTC,
General Motors Corporation

STATE OF MICHIGAN

Commission of Agriculture
Douglas E. Darling
James E. Maitland
Shirley A. Skogman
Deanna Stamp
Jordan B. Tatter

JOHN ENGLER, Governor

DEPARTMENT OF AGRICULTURE

P.O. BOX 30017 • LANSING, MICHIGAN 48909
611 W. OTTAWA • LANSING, MICHIGAN 48933
DAN WYANT, Director

TO: Dan Wyant, Director, Michigan Dept. of Agriculture
Kathy Wilbur, Director, Michigan Dept. of Consumer & Industry Services
Ed Koerner, Director, Chassis/Power Train, General Motors Corporation
John Ferrell, Director of Biofuels Development, US Dept. of Energy
Keith Muxlow, Director, Corn Marketing Association of Michigan
Keith Creagh, Deputy Director, MDA
Dale Sherwin, Director of Agriculture Policy, MDA
Robert Craig, Director, Office of Agriculture Development, MDA

FROM: Denise Yockey, Public Information Officer, MDA
Vincent Parris, Economic Development Manager, MDA

DATE: May 17, 1999

RE: Ethanol Vehicle Challenge Media Event – Mon., May 24

Following is the proposed itinerary for the Ethanol Vehicle Challenge news conference set for 8:45 a.m. on Monday, May 24, at the State Capitol in Lansing. Our intention is a 15-minute news conference, a review of the alternative-fuel vehicles, followed by a symbolic fueling trip to the Ball Park Mobil gas station at the corner of Larch Street and Michigan Avenue.

What. The Ethanol Vehicle Challenge, sponsored by General Motors and US Department of Energy, is a competition among 14 college teams from the US and Canada in 1999 Chevrolet Silverado pick-up trucks that have been retrofitted to burn ethanol without sacrificing fuel economy and performance. The collegians' competition runs from May 19 to 25, beginning in Milford, Michigan, followed by a brief promotional tour through the Midwest. The Lansing stop is the only Michigan stop of the promotional tour.

The week-long Ethanol Vehicle Challenge will test exhaust emissions, fuel economy, acceleration, driveability, handling, range and cold- and hot-start performance. The defending champion team is from Wayne State University's College of Engineering, and they will be in this year's competition along with a returning team from Kettering University. Teams will also receive points for a written design report and an oral technical design presentation. Winners receive cash awards.

Who. About 250 people are in the entourage from the various university teams. Also attending will be representatives of several state departments, private industry, and the Corn Marketing Committee. News media will be invited.

When. News conference set for 8:45 a.m., Mon., May 24. Activities should end by 9:15 a.m.

Where. At the east approach to the State Capitol in downtown Lansing. A lectern with sound system will be located just east of the Austin Blair statue, with the trucks in the background. In the event of rain, remarks will be made in the Rotunda of the State Capitol.

Itinerary. The order of speakers will be as follows:

8:30 a.m.	Participants arrive at site.
8:45 p.m.	Welcome and opening remarks. Acknowledge VIPs. - Dan Wyant, Michigan Dept. of Agriculture
8:50 a.m.	Importance of Ethanol Vehicle Challenge to Auto Industry - Ed Koerner, GM
8:54 a.m.	Developing alternative energy for the future - John Ferrell, US Dept. of Energy
8:58 a.m.	State support for alternative fuels, niche research activities - Kathy Wilbur, Michigan Dept. of Consumer & Industry Services
9:02 a.m.	Conclusion & invitation to preview team vehicles - Dan Wyant

Concluding Activities. Participants will be invited to view all alternative-fuel vehicles parked on the Capitol approach and Allegan. Immediately after news conference, Ed Koerner will be invited to accompany the Wayne State vehicle for refueling at the Ball Park Mobil Station three blocks away. Very shortly after the news conference, all vehicles will depart the State Capitol for their next official stop in Fort Wayne, Indiana.

C: Maura Campbell, CIS
Angela Graf, Bryan & Bryan, Inc.

MICHIGAN
DEPARTMENT
OF
AGRICULTURE

MARKETING
AND
COMMUNICATIONS
DIVISION

P.O. BOX 30017
LANSING, MI 48909
517-373-1104
800-292-3939
FAX: 517-335-7071
www.mda.state.mi.us

Contact: Denise Yockey, (517) 373-1104
May 24, 1999

Michigan Agriculture and Industry Officials Welcome Engineering Students in Corn-Fueled Vehicles

Ethanol Vehicle Challenge Makes Only Michigan Stop at State Capitol

A team of vehicles of the future visited the State Capitol today on the promotional leg of a week-long competition among college engineering teams seeking to perfect engines run on 85 percent ethanol, a corn-based fuel. The 14 college teams, which included two from Michigan, were greeted by Michigan Agriculture Director DanWyant, Michigan Consumer and Industry Services Director Kathy Wilbur, General Motors Director Ed Koerner and US Department of Energy Biofuels Development Director John Ferrell.

"The Ethanol Vehicle Challenge is an exciting program for Michigan agriculture, particularly as we continue to pursue an ethanol production plant for this state, which will further boost the value-added opportunities for Michigan-grown corn," Wyant said Monday morning as the teams gathered on the main approach to the State Capitol.

CIS Director Wilbur emphasized the state's commitment to alternative fuels, particularly ethanol. "The CIS Energy Division promotes energy efficiency and renewable energy resource development in Michigan," Wilbur said. "Clearly, ethanol is an important component of our overall effort to encourage the use of alternative fuels. It's gratifying to see the tangible results of an energy grant literally in action."

This is the fourth year of the Ethanol Vehicle Challenge, which is cosponsored by General Motors, the US Department of Energy, the Governors Ethanol Coalition and Natural Resources Canada. Governor John Engler is a member of the 21-state Governors Ethanol Coalition. The 14 collegiate teams include last year's defending champion, Wayne State University, as well as Kettering University from Flint. Other teams hail from Ohio, Illinois, Idaho, California, Kansas, Nebraska, Texas, Missouri and Ontario, Canada.

General Motors Corporation provided the student teams with a new Chevrolet Silverado pick-up trucks, that they adapted to burn a fuel containing about 85 percent ethanol. Typical commercial gasoline contains about 10 percent ethanol. Last year's competition involved the Malibu passenger car. The vehicles are tested on exhaust emissions, fuel economy, acceleration, handling, off-road performance, hill climbing, engine noise and other factors. Winners will be announced later this week.

- more -

The Ethanol Vehicle Challenge visit comes one week after another alternative-style vehicle visited the Michigan State Capitol. Two Ford pick-up trucks lubricated with vegetable-based motor oil stopped in Michigan last week as part of a cross-country "Interstate 2000" promotional tour. During Interstate 2000's visit to Michigan's Thumb, state and agricultural officials cut the ribbon on a new soybean processing facility in Ubly, that will produce the vegetable-based motor oil and other soybean by-products.

The State of Michigan encourages the use of ethanol and other alternative fuels in state-owned vehicles, and the Michigan Department of Agriculture has committed a half-dozen cars to use the vegetable-based motor oil. Ethanol is a domestic fuel made primarily from corn and other grains, but also from waste materials from the food and beverage processing industries. Today, nearly 2 billion gallons of ethanol are produced annually in the US and Canada.

The Michigan Department of Agriculture is the official state agency charged with serving, promoting and protecting the food, agriculture and economic interests of the people of the State of Michigan. MDA programs serve all sectors of agriculture, which is Michigan's second-largest industry.

-30-

(This news release can also be viewed on the World Wide Web at ***http://www.mda.state.mi.us***)

1999 Ethanol Vehicle Challenge

Stopover Events: Lansing & Ft. Wayne

May 24, 1999,

Ed Koerner Remarks

- **Introductory remarks**

- The trucks they entered in the challenge in May had little resemblance to the ones we gave them last November.

- The teams developed systems and modified the vehicles to reduce emissions, improve fuel economy, and achieve excellent cold startability without sacrificing performance.

- Over the past five days, the teams underwent a series of testing and evaluation. They were judged on emission, cold start, noise, acceleration, fuel economy, off-road handling, hill climb, and trailer towing.

- The Ethanol Challenge provides GM with the opportunity to work with the other sponsors. That relationship continues as GM of Canada will be the major sponsor for the Ethanol Vehicle Challenge 2000 and Silverados will, once again, be the vehicles for ethanol development.

- This year's challenge gave us a chance to develop better relations with the participating colleges and universities and the student teams.

- That is what this program is all about, the schools and the student teams. We believe that this program has offered them a valuable learning experience that will complement their formal education.

- Conversely, GM intends to learn from the experiences of the participating schools about ethanol vehicle technology and its potential application in its core products.

- I have reviewed the major technologies developed by the teams. They are impressive. Some of these include:

- Increased Compression Ratio
- Displacement Change
- Supercharging and Turbocharging
- Distillation System
- Exhaust Gas Recirculation Cooler
- Thermal Storage Devices
- Heated Intake Air/Fuel (for low temperature starts) and
- Other major vehicle modifications.

- From GM's perspective, there is much we will learn from the innovative ideas applied by these students .

- General Motors is committed to the advancement of alternative vehicles and fuel technology. Our quest is to improve the environmental per-formance of vehicles that appeal to our customers' needs and expectations.

- That is why we are interested in the ethanol vehicle technology that these teams have developed.

- GM will release a Chevrolet S10 and GMC Sonoma pickup during the 2000 model year that will be flexible fuel capable for E85 or gasoline for four-cylinder. What we learn from this program and the 1999 Ethanol Vehicle Challenge will be helpful in GM Truck's future application of ethanol vehicle technology.

- Sponsorship of the challenge allows GM to demonstrate its commitment to improve the environmental performance of its trucks. These Silverados have the most environmental features in GM Truck's history.

- They have all-new, industry leading powertrains with increased horsepower and superior mileage ratings. And it offers lower emissions.

- At 89% recyclable, the Silverado is the most recyclable full-size truck in GM's history.

Press Conference

GM Truck Assembly Plant
Fort Wayne, IN

May 24, 1999 ▫ 3:00 PM

S P E A K E R S

Jim Falloon, Welcome
Plant Manager
GM Truck Assembly Plant

Team Representative (to be announced)

John Ferrell
Director, Office of BioFuels Development
U.S. Department of Energy

Ed Koerner
Executive Director Chassis/Powertrain/HVAC/PTC
General Motors Corporation

Media Advisory from the General Motors Truck Group

What: 1999 Ethanol Vehicle Challenge trucks and student teams stop over in Ft. Wayne en route from Milford, Michigan to Springfield, Illinois

· Remarks by/interviews with students, GM Truck Group executives and representatives of the US Department of Energy
· Photo ops with student teams and their vehicles

When: 3:00 - 4:00 p.m., Monday, 24 May 1999

Where: General Motors Truck Assembly Plant, 12200 Lafayette Center Road, Roanoke, Indiana. (The event will take place in the visitor parking lot by the flagpole. Parking for the news media has been reserved in the adjacent employee lot. Security officers will direct you.)

Who: Student competitors in the 1999 Ethanol Vehicle Challenge Ed Koerner, executive director, chassis, powertrain, heating/ventilation/Air conditioning, and cooling systems, General Motors Truck Group
John Ferrell, director, Office of Fuels Development (part of the Office of the Deputy Assistant Director for Transportation Technologies), US Department of Energy
Jim Falloon, plant manager, GM Ft. Wayne Assembly

Background: In the autumn of 1998, General Motors donated one 1999 Chevy Silverado full-size pickup, spare material and technical support to each of 14 top US and Canadian engineering schools participating in the 1999 Ethanol Vehicle Challenge. The objective for each student team was to modify their vehicle to operate on a mix of 85 percent ethanol and 15 percent gasoline.

The modifications have been made and the trucks are being judged this week at the General Motors Proving Ground in Milford, Michigan. Criteria for judging include acceleration, emissions, cold start driveability and noise pass-by performance. After the trucks are judged in Michigan, they will travel in a motorcade to Springfield, Illinois, passing through Ft. Wayne on Monday, where the awards ceremony will be held. The Ethanol Vehicle Challenge gives students practical experience working with "real world" products and engineering issues.

GM benefits by learning what the students have discovered about ethanol vehicle technology and its potential application to real-life products. The 1999 Ethanol Vehicle Challenge is co-sponsored by General Motors, the US Department of Energy and Natural Resources Canada.

Contact: Tom Beaman, GM Truck Group Communications, 248-753-7164

Ethanol Vehicle Challenge
Fort Wayne Stopover
May 24, 1999

Agenda

2:00 PM	Motorcade arrives and is directed to park in a pre-determined pattern in (Audit Area) Rubber Room.
BY 3:00 PM	Press and Guests arrive. Approximately 200 total participants.
3:00 – 3:15 PM	Presentations from podium: **Jim Falloon** – Plant Manager **Student** - TBD **John Ferrell** – US Department of Energy **Ed Koerner** – Executive Director, Chassis Powertrain, HVAC/PTC
3:15 – 3:30 PM	Photos and video of vehicles, interviews with students.
3:30 – 4:30 PM	Vehicles on display for FWA employees during shift change. (Students positioned at vehicles to answer questions until 4:00 PM.)
4:00 PM	Motorcade participants view safety tape & Body / Paint tape in rubber room. (Media departs.)
4:15 PM	Meeting with Tour Guides to Review Route
4:30 – 6:15 PM	Plant Tour - approximately 180 participants. (Tanker truck refuels 14 ethanol vehicles.)
6:15 – 6:30 PM	Refreshments and final Q & A in Rubber Room

Press Conference

Capitol Steps
Indianapolis, IN

May 25, 1999 ■ 10:00 AM

S P E A K E R S

Niles Parker
Deputy Director
Indiana Department of Commerce

Nate Kimpel
New Energy Corporation

Joe Pearson
Assistant Commissioner of Agriculture
State of Indiana

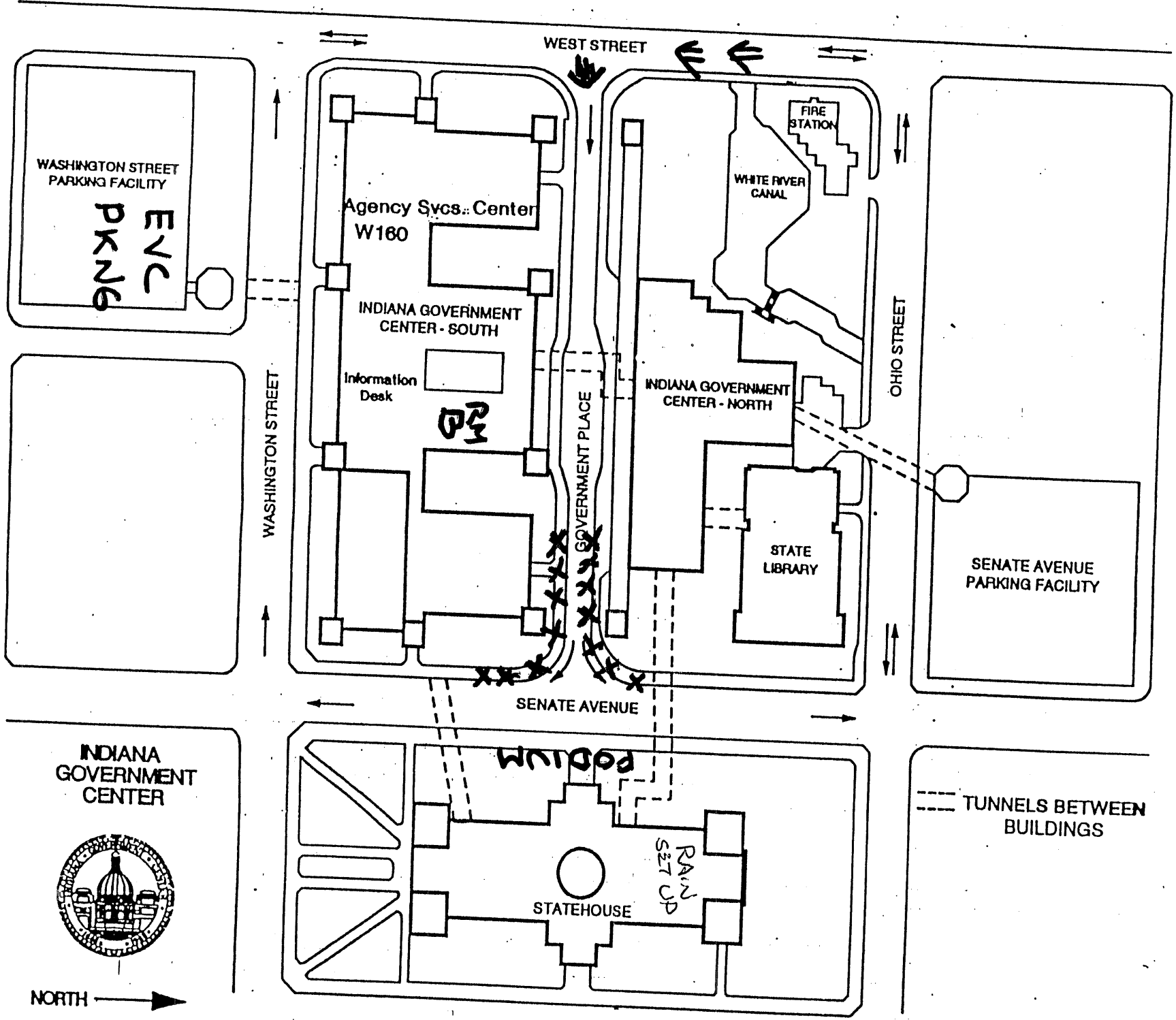
Mark Maher
Truck Group
General Motors Corporation

National Ethanol Vehicle Challenge
Agenda
Tuesday - May 25, 1999

STAR FFA

8:30 am	Introductions/Outline responsibilities
9:00 am	Students locate to assigned areas • Registration table (2) • Logistics - Motorcade Set up (6) • Logistics - Conference Room B (2) • Logistics - Restrooms/refreshments (2) • Presentations (all)
9:15 am	Ethanol Vehicles Arrive (direct vehicles to parking)
9:45 am	Invited Guests Arrive (direct guests to West Side of Statehouse)
10:00 am	Ethanol Presentation (If it rains, we will move into the Statehouse North Atrium)
10:45 am	EVC Vehicles/Students Depart for Armory (load box lunches)
	Clean up

Contacts for Information:
Niles Parker, Director of Energy Policy - Event Chairman
Phil Pollock, Department of Commerce - Energy Policy Division
DeeDee Sigler, Director of Communications - Agriculture
Lori Smith, Director of Value Added Grant Program - Agriculture



5/25/99 INDIANAPOLIS EVC EVENT

Williams Energy
Ethanol Plant

4:15 - 5:00	Press Conference
	Truck Refueling
5:00 - 7:30	Barbecue
	Ethanol Plant Tours

1999 EVC Award's Banquet

Springfield, IL
May 26, 1999

11:45 AM	Welcome	Joe Hampton, IL Dept of Agriculture
	Introduction	Jim Fleming, WDZQ Radio
	Guest Speaker	Lt. Governor Corrine Wood, State of Illinois
12:00 PM	Dinner	
12:30 PM	Master of Ceremonies	Jim Fleming, WDZQ Radio
	Video Presentation	Cindy McFadden, Argonne National Lab
12:45 PM	Master of Ceremonies	Jim Fleming, WDZQ Radio
	Award's Presentations:	
	GEC Faculty Award	Greg Krissek, Ass't Secretary of Agriculture, State of Kansas
	Simon Vega Award	Bob Larsen, Argonne National Lab
	Best Appearing Vehicle	Jerry Barnes, GM – Retired
	Most Innovative Component	Vic Riddle – National Corn Growers Assn
	Best Acceleration	Mark Farone & Brian Ernst, GM Truck Group
	Best Off-Road	
	Best Hill Climb	
	Best Oral Presentation	T.G. Powell, U.S. Department of Energy
	Best Fuel Economy	Jim Redding, Williams Ethanol
	Best Flame Arrestor Design	Jim Johnson, President – Canadian Renewable Fuels Assn.
	Best Engine-Out Emissions	Kenny Hartman – IL Corn Marketing Board
	Best Ethanol Conversion	Eric Vaughn, President – Renewable Fuels Assn
	Lowest Emissions	Mark Maher, GM Truck Group
2:00 PM	Master of Ceremonies	Jim Fleming, WDZQ Radio
	Top Award's Presentations:	
	5th Place Overall	Steve Sorum – NE Ethanol Board
	4th Place Overall	Pam McDonough, Director, IL Department of Commerce & Community Affairs
	3rd Place Overall	Tom Smyth, Natural Resources Canada
	2nd Place Overall	Tom Gross, Deputy Asst Secretary for Transportation Technologies, U.S. DOE
	1st Place Overall	Rick Scheidt, Brand Manager – Chevrolet Silverado, General Motors Corporation

1999 Ethanol Vehicle Challenge Winners

May 26, 1999

This year's winner is University of Illinois at Chicago. The vehicles of all of the top five teams met low emission vehicle (LEV) standards. Many of the entrants produced ethanol vehicles that surpassed the on-road performance of their gasoline counterparts. Over 200 students from 14 schools competed for more than $21,000 in prizes, including $3,500 for first place overall.

The overall awards went to:
First Place - University of Illinois at Chicago
Second Place - University of Texas at El Paso
Third Place - Kettering University, Flint, Michigan
Fourth Place - University of Waterloo, Ontario, Canada
Fifth Place - Wayne State University, Detroit, Michigan

Two faculty advisors received $10,000 each for their outstanding contributions. Professor Charles Allport, Assistant to the Academic Vice President, Cedarville (Ohio) College, founded Cedarville's engineering department and has fielded many vehicle competition teams over the past several years. Dr. Ryan Wicker, Assistant Professor of Mechanical Engineering, University of Texas at El Paso, established a state-of-the-art laboratory and an automotive engineering course that supports the Challenge.

The 1999 Ethanol Vehicle Challenge was a seven-day competition, featuring student designs and conversions of 1999 four-wheel-drive Chevrolet Silverado pickup trucks re-engineered to run on ethanol fuel. The Ethanol Vehicle Challenge gives students real-world experience as they convert new vehicles built for gasoline into optimized vehicles fueled solely by E85 (85% ethanol/15% gasoline). The goal is an ethanol-fueled vehicle with greater fuel economy and lower exhaust emissions, but with the driveability, performance, and consumer appeal of a conventional gasoline vehicle.

Schools earned special recognition for excelling in the following categories:

Simon Vega Sportsmanship Award - Idaho State University
Most Innovative Component - University of Nebraska-Lincoln
Best Acceleration - Cedarville College
Best Off-Road Handling - Kettering University
Best Hill Climb Performance - Minnesota State University at Mankota
Best Oral Presentation - University of Waterloo
Best Fuel Economy - University of Illinois at Chicago
Best Flame Arrestor Design - University of Illinois at Chicago
Best Engine-Out Emissions - University of Waterloo
Best Ethanol Conversion - University of Nebraska-Lincoln
Lowest Emissions - Wayne State University
Best Appearing Vehicle - Minnesota State University at Mankota
Best Cold-Start Performance - University of Texas at El Paso

For more information contact Angela Graf, 847/581-9363

Headline Sponsors:
United States Department of Energy
General Motors Corporation
Natural Resources Canada

Sponsors:
Illinois Department of Commerce and Community Affairs
State of Nebraska
Council of Great Lakes Governors
Renewable Fuels Association
Illinois Corn Marketing Board

porters:
Governors' Ethanol Coalition
National Corn Growers Association
Canadian Renewable Fuels Association
Williams Ethanol
Delphi Automotive and Energy Systems

Competition Administrator:
Center for Transportation Research, Argonne National Laboratory

Participating Schools:
Cedarville College, Ohio
Crowder College, Missouri
Kettering University, Michigan
Idaho State University
Illinois Institute of Technology
Minnesota State University
University of California, Riverside
University of Illinois at Chicago
University of Kansas
University of Nebraska-Lincoln
University of Texas at Austin
University of Texas at El Paso
University of Waterloo, Ontario
Wayne State University, Michigan

U.S. Department of Energy
GM General Motors
Natural Resources Canada

1999 Ethanol Vehicle Challenge
Final Results

Ethanol Challenge Awards	
First Place Overall	University of IL-Chicago
Second Place Overall	University of TX-El Paso
Third Place Overall	Kettering University
Fourth Place Overall	University of Waterloo
Fifth Place Overall	Wayne State University
Best Oral Presentation	U. of Waterloo
First Place- Appealing Vehicle	Minnesota State University- Mankato
Second Place- Appealing Vehicle	U. of Nebraska
Third Place- Appealing Vehicle	U. of TX-El Paso
Best Ethanol Conversion	U. of Nebraska
Lowest Emissions	Wayne State U.
Best Engine Out Emissions	U. of Waterloo
Best Fuel Economy	U. of IL- Chicago
Most Innovative Component	U. of Nebraska
Best Flame Arrestor	U. of L-Chicago
Simon Vega Sportsmanship	Idaho State U.
Best Off-Road Handling	Kettering U.
Best Acceleration	Cedarville College
Best Cold Start Peformance	U. of TX-El Paso
Best Hill Climb	Minnesota State U.-Mankato
Spirit of the Challenge	U. of Kansas
GEC Faculty Advisor Award	Chuck Allport-Cedarville
	Ryan Wicker-UTEP

5/26/99

1999 Ethanol Vehicle Challenge
Final Results

Vehicle #	School	Written Design Report	Oral Design Presentation	Vehicle Design Inspection	Emissions	On-road Fuel Economy	EPA Fuel Economy	Cold Start	Cold Start Emissions	Off Road	Acceleration	Driveability	Hill Climb	Total Penalties	Total	Standing
	Available Points	100.0	100.0	75.0	200.0	50.0	150.0	25.0	75.0	50.0	50.0	75.0	50.0		1000.00	
1	Univ. of Waterloo	73.0	100.0	39.8	140.0	25.1	102.3	10.2	50.8	43.8	29.8	15.0	47.1	-5.0	682.00	4
2	Univ. of Texas, El Paso	78.4	83.3	15.0	190.0	33.9	104.0	15.2	75.0	34.5	40.3	63.7	45.4	0.0	778.59	2
3	Kettering Univ.	75.0	85.3	60.5	135.0	28.3	86.7	19.0	38.8	50.0	46.0	67.8	48.5	0.0	740.85	3
4	Univ. of Nebraska	66.6	82.3	75.0	125.0	10.6	36.8	22.6	29.9	34.0	33.0	55.5	49.4	31.0	589.63	6
5	Cedarville College	59.3	77.9	24.2	0.0	41.7	94.2	8.1	45.1	27.9	50.0	64.7	45.8	0.0	538.90	9
6	Crowder College	20.0	77.4	22.0	0.0	50.0	150.0	20.9	24.3	27.6	36.5	59.6	47.3	11.0	524.64	10
7	Idaho State	44.5	70.0	26.7	60.0	10.0	77.6	19.4	61.1	10.0	40.1	47.2	47.3	9.0	505.07	11
8	Univ. of CA, Riverside	53.9	92.6	29.8	80.0	43.4	110.6	5.0	47.8	24.3	30.0	21.6	48.6	5.0	582.53	7
9	Wayne State	62.2	77.9	34.5	190.0	19.5	105.1	5.0	46.3	44.6	10.0	15.0	42.0	0.0	652.18	5
10	Mankato State	92.1	57.3	35.1	0.0	21.3	58.7	16.7	62.8	38.0	38.3	75.0	50.0	2.0	543.17	8
11	Univ. of IL, Chicago	60.7	68.1	38.2	190.0	44.2	112.1	18.4	69.2	42.8	29.1	64.7	47.3	0.0	784.71	1
12	Illinois Institute of Tech.	35.2	91.6	53.8	0.0	18.8	30.0	15.8	15.0	48.0	28.5	68.8	44.8	43.0	407.43	13
13	Univ. of Texas, Austin	100.0	67.1	25.3	0.0	24.6	0.0	25.0	74.8	44.0	33.2	40.1	47.5	0.0	481.60	12
14	Univ. of Kansas	26.9	20.0	27.6	0.0	0.0	0.0	0.0	0.0	19.7	0.0	0.0	10.0	0.0	104.12	14

Team Promotional Activities

The Team

The nstruction of these vehicles allows the team members to see their designs brought into reality. The design is no longer left on a blank sheet of paper, but must be built with the realization that what can be designed can not always be built. Business and communication skills are developed as well. The communication of ideas must be handled in both technical and non-techical terms because the team includes not only engineering aspects, but business aspects such as fund-raising and administration.

The goal is not only to build a car, but build a team.

The '99 team is larger and more experienced, with a strong desire to win!!!

Sponsorship

We have 3 sponsorship levels; V8-Club($3000+), V6-Club($1000+) and the Turbo-Club($100+).

The V8-Club includes:

- 2- 8" x 8" company logo displayed on vehicle.
- Vehicle present during a promotional event
- Framed team picture with vehicle.
- Company logo displayed on team uniforms.
- V8-Club designation in promotional materials.

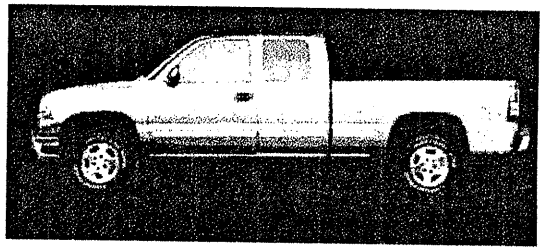
The other levels are similar, but would feature less logo display space and other changes

Other displays can be negotiated

SAY YES!

Call (312) 567-3172 for more information or contact us at the address on the front.

Don't lose out on this opportunity.



SUPERHAWK

1999 Ethanol Vehicle Project

Illinois Institute of Technology

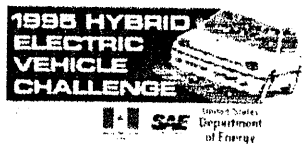
Contact for more Info:
EVC Project - MMAE Dept,
Room 20-E1 SAE
10 West 32nd Street
Chicago, IL 60616
312-567-3172
Fax: 312-567-7230

IIT

Building the Future

Illinois Institute of Technology began building the future in 1991 when we were one of 24 schools selected for the **1991 Natural Gas Vehicle (NGV) Challenge**. We captured *3rd place* at the first **NGV Challenge** and placed in the top half in the last two. We like to think that, if success were measured by the ratio of points to the number of team members and budget size, then we would have been first every time.

The next project was construction of a power-assist Hybrid Electric Vehicle (HEV) for the **HEV Challenge**. It competed at the **1995 HEV Challenge** winning a number of prizes, including "best emissions" and came in *6th overall*.



In 1996 IIT entered the **Propane Vehicle Challenge** featuring a gaseous injection. The vehicle was a 1996 Dodge Grand Caravan and our conversion won the "best fuel economy" prize. The entry for the **1997 Propane Vehicle Challenge** featured a liquid propane injection system which allowe d us to finish in *7th place*.

We are now entering the second year of the **Ethanol Vehicle Challenge (EVC)**, our fourth automotive project. During the **1998 EVC** we placed *6th overall out of 14 teams* in a very tight competition with our 1997 Chevrolet Malibu called the SuperCornHawk.

The **1999 Ethanol Vehicle Challenge** is our current project. The competition features a 1999 Chevy Silverado just recently issued to each of the 14 schools. The challenge has increased for 1999. The truck has to run cleaner, run better and run faster. With your support the ***SUPERHAWK II will*** soar above the rest.

The Return

Contributions to the development of alternative fuel vehicles benefits everyone. Our previous projects have been made possible only by the tax deductible support of organizations and businesses such as yours. We all benefit from a cleaner environment. **Sponsors** become part of the publicity and exposure not only in the public but in industrial and governmental circles and show their commitment to higher education and to environmentally sound practices.

The Publicity

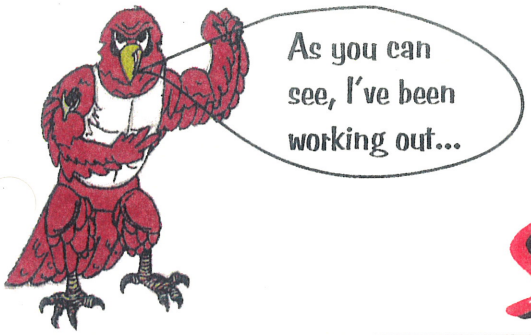
Illinois Institute of Technology automotive projects have received publicity in print, on television and on radio, including the Chicago Tribune, Sun-Times, WFLD(FOX), WGN, and CLTV.

The Competition

The 1999 Ethanol Vehicle Challenge is sponsored by the United States Department of Energy, Natural Resources-Canada, and General Motors. Fourteen University and College from the United States and Canada will compete at the General Motors Proving Grounds in Milford, Michigan. The events will include, written technical and oral reports, solo, acceleration, towing, emissions, driveablity and cold starting.

Budget

Vehicle Modifications		**$ 16,550**
Injectors	$ 1,400	
Cold Starting Modifications	$ 3,000	
Cold Start Controller	$ 1,000	
Engine Controller	$ 3,500	
Fuel Supply Components	$ 1,400	
Exhaust/Convertor	$ 2,250	
Engine Modifications	$ 4,000	
Testing Supplies and Services		**$ 2,000**
Misc. Supplies and Expenses		**$ 1,750**
Team Supplies		**$ 2,000**
Travel Expenses		**$ 8,000**
Totals		**$ 30,300**



A Newsletter for supporters of the Illinois Institute of Technology's vehicle projects.

ILLINOIS TECH'S SUPERHAWK II

VOLUME 2, ISSUE 3 MARCH 1999

WELCOME to ISSUE #3 dedicated to the ETHANOL VEHICLE CHALLENGE TEAM who work together to develop the SUPERHAWK II, a Chevy Silverado. This vehicle is in the process of being transformed to operate on E85 fuel. March has been dedicated to getting all final parts and supplies. In the past month the team has been working hard to keep our momentum going to finish the project with enthusiasm and with great results.

The efforts from the business community and others has been outstanding. Over 20 sponsors have pledged their support to the SUPERHAWK II with donations of supplies and cash totaling over $5,000!!! In addition to this, the IPRO program at IIT and Pritzker-Galvin's matching funds have responded generously to our project.

Dyno (engine) testing on our stock engine began in late February and lasted for a week. Much time was spent solving a number of problems the team encountered while trying to efficiently and effectively test our 2nd stock motor in order to obtain baseline data for Gas and Ethanol. During one of the last days in the Dyno room, we were finally able to get good results from our test motor. Most of our problems dealt with computer parameters and incorrect hookup of various parts. The knowledge gained from this experience was unmeasurable and we would like to especially thank Speed Service in Chicago, IL for donating the equivalent of $2,000 of Dyno time to support our effort.

Project updates consist of the truck being currently painted and all air brush and sticker supplies are being collected as well as uniforms made for the team. Our technical paper is being written by Team IV and Team I (engine/driveline) is anxious to get currently 5 new major systems custom installed on the vehicle to help it perform better. Team II (conversion) has finished and tested a flame arrestor design and Team III (special teams) is working out the bugs for our cold start solution and another system to be installed for a quicker engine warm up.

As promised, we will begin to reveal the secrets of our vehicle. This vehicle is very much in contrast to last year's entry. Illinois Tech has decided to build the SUPERHAWK II in order to enjoy the power benefits of ethanol while also keeping emissions, fuel economy and drivability in excellent condition. Systems will be in place to enhance fuel economy and emissions. The team is very excited and is anticipating the official debut of the SUPERHAWK II the first few days of May. This truck will represent an enormous amount of hard work done by our team to do the best job possible with the limited time preparation given to us. Our team only wishes we could just focus on the truck and not have to worry about homework!!! Please note there is no picture of the Silverado, for next month it shall only be called SUPERHAWK II.

Sponsors

IIT would like to thank the growing list of sponsors for pledging their support to the *SuperHawk* II. These sponsors include:

Illinois Department of Commerce and Community Affairs, IIT IPRO Program, Vortech Engineering, Extrude Hone, Lunati Cams, Flowmaster, Bosch, Allied Signal, California Customs, Gear Vendors, Hotchkis Performance, Speed Service, K&N Engineering, Saporito Plating, General Engine and Machine, Centaur Thermal Systems, MSD Ignition, Spearco Performance Products, Knight's Body Shop, RPS Service LTD., and the Illinois Corn Marketing Board.

About

The Ethanol Vehicle Challenge is an engineering competition sponsored by the U.S. Department of Energy, Natural Resources Canada and General Motors. Its goal is to convert a 1999 Chevy Silverado to run on 85% ethanol, while improving the performance and emissions.

The competition will begin at the General Motors proving ground in Milford, Michigan and conclude with a 3 day rally event to different places across the Mid-West where the vehicle will be showcased.

This is IIT's eighth automotive competition. The project is one of IIT's Interprofessional Projects (IPRO). These are designed to bring real-life engineering to the classroom. They were developed to bring not only the different engineering disciplines but also business and law into a single project.

If you would like to be a sponsor of this exciting project and learn more, feel free to contact us at the below address. We will keep you informed of further PR events at our school and in the Chicagoland area.

SPONSORS: We have displayed your Company's Name proudly on our website. Please check it next week for work-in -process pictures!!!!

SAE
10 W. 32nd St
Chicago, IL 60616
(312) 567-3172
Email:
sae@mmae.iit.edu

Web Site:
http://mmae.iit.edu/~sae

IIT SUPERHAWK II

A Newsletter for supporters of the Illinois Institute of Technology's vehicle projects.

VOLUME 2, ISSUE 2 FEBRUARY 1999

What's Hap'n

Welcome to the second edition of the IIT newsletter dedicated to Super Hawk II, the Illinois Institute of Technology entry to the 1999 Ethanol Vehicle Challenge!!! As promised, we'd like to share some of our plans for the vehicle, as well as our team structure.

As mentioned last month, our team consists of students belonging to the Society of Automotive Engineers and IPRO (Interprofesional projects program). Our team is twice as large as last year, with a mix of students from freshman to senior. This team has been organized into four separate teams that work together to make this project possible.

TEAM I - Engine/Driveline
TEAM II - Conversion
TEAM III - Special Teams/Sol.
TEAM IV - Design/PR

Team I is in charge of our aggressive engine and driveline strategy. They are making the motor stronger, breath better, and enjoy the benefits of Ethanol.

Team II is responsible for Ethanol conversion methods, ensuring compatibility and a safe, efficient system.

Team III addresses specially engineered systems for the vehicle. They are addressing the problems with Ethanol and creating other unique systems to help the vehicle perform better.

Team IV is responsible for the overall look of the truck, the team, and all external issues. In addition, this team is responsible for relations with the public and contact with sponsors.

Updating last month progress, dyno testing by the team will have begun the week you receive this letter. Also, testing using state-of-the-art equipment will be used to test engine out emissions on at least two different engine configurations. These configurations range from a stock configuration to a very modified engine. The modified engine is still being developed and the ethanol compatible system is almost done. Team III is developing two unique systems for the vehicle and team IV is making sure the SUPERHAWK II does not fly by unnoticed.

The team has had some problems. Parts delays have slowed some of the teams' progress. But the team is confident that the SUPERHAWK II will be flying around for on-road testing by the scheduled time in March.

We have redesigned a web-site for the challenge. We invite you to visit it often as we improve and promote it and get more exposure for our generous sponsors. Next month is critical for us, and we can't wait to share the secrets of SUPERHAWK II!!!

Sponsors

IIT would like to thank these sponsors for pledging their support to the *SuperHawk* II. These sponsors include: Illinois Department of Commerce and Community affairs, the IIT IPRO program, Vortech Engineering, Extrude Hone, Lunati Cams, Flowmaster, Bosch, Allied Signal, California Customs, Gear Vendors, Hotchkis Performance, Speed Service, K&N Engineering, Saporito Plating, and General Engine and Machine

About

The Ethanol Vehicle Challenge is an engineering competition sponsored by the U.S. Department of Energy, Natural Resources Canada and General Motors. Its goal is to convert a 1999 Chevy Silverado to run on 85% ethanol, while improving the performance and emissions.

The competition will begin at the General Motors proving ground in Milford, Michigan and conclude with a 3 day rally event to different places across the Mid-West where the vehicle will be showcased.

This is IIT's eighth automotive competition.

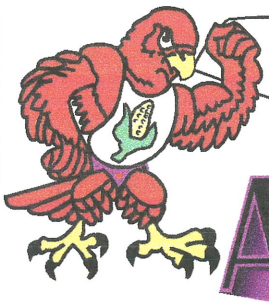
The project is one of IIT's Interprofessional Projects (IPRO). These are designed to bring real-life engineering to the classroom. They were developed to bring not only the different engineering disciplines but also business and law into a single project.

If you would like to be a sponsor of this exciting project and learn more, feel free to contact us at the below address. We will keep you informed of further PR events at our school and in the Chicagoland area.

SAE
10 W. 32nd St
Chicago, IL 60616
(312) 567-3172
Email:
sae@mmae.iit.edu

Web Site:
http://mmae.iit.edu/~sae

SUPERHAWK



IIT AUTOLETTER

A Newsletter for supporters of the Illinois Institute of Technology's vehicle projects.

Volume 2, Issue 1

JANUARY 1999

What's Hap'n

Welcome to the first issue of the IIT autoletter for 1999!!! We apologize for being away for awhile, but we have great news and updates, new leaders and a new competition for 1999!!!

My name is Dave Wyack and I am the new SAE President and project leader at IIT. Helping me this year include my Co-leader Jesse Richard, Secretary Jon Richard, and Technical Coordinator Scott Burgauer.

The Illinois Institute of Technology was chosen to compete in the 1999 Ethanol Vehicle Challenge, an engineering competition sponsored by the Department of Energy. We picked up our vehicle on November 15, 1998 at a Ceremony at GM's Truck Center in Pontiac, Michigan. Our Taupe 1999 Chevrolet Silverado was a fleet vehicle used in testing by GM. It had 11,000 miles on it, but it was loaded with a value new of $31,000!!! The vehicle was soon descended upon by the team to begin the transformation into the Superhawk II. Like last year, the Superhawk II is one of IIT's interprofessional projects, IPRO for short. An IPRO is a one to two semesters long project designed to integrate the engineering disciplines. All new undergraduates will be involved in at least one of these projects.

Even before any work could be completed, a complete strategy was planned for the conversion of the truck earlier last semester. We are planning to be much more aggressive this year in our strategy, which will be disclosed in the next issue. The team this year is bigger, more experinced, and ready to win this spring. In addition to last year, we planned an aggressive PR campaign to show off the truck and the sponsors to truly get the word out on this awesome project. Testing of the vehicle began shortly after it was received. These included performance testing (such as who could make it around campus the fastest), sound tests with new equipment, and emissions testing during cold-starts.

In October, there was a workshop at Argonne National Laboratory, the organizers of the competition. The workshop provided more technical information on the vehicle's systems. It also provided information about the competition sponsors and the events to take place in Michigan and the to be decided places afterwards.

By December, the Superhawk II was well into its baseline testing and teardown on the vehicle begun. This vehicle will be rebuilt better than ever. The team was very impressed with the design of this all-new truck and engine, and is excited to improve it even further through engine development and fine-tuning for ethanol. Last semester ended with a presentation on the work completed during the long semester. The judges of the IPROs were impressed by the presentation given by the team on Superhawk II. They were so impressed that it won both major awards during the presentation day, against over 15 projects competing!!!

The pace has slowed over break, but the team deserved a rest. All the components necessary for the vehicle modifications were determined before the break. Over winter break, General Motors, subsidiaries, and outside companies willing to help through their generous sponsorship donated several components. A listing will be announced during a PR event coming up late this month.

With renewed vigor provided by the break, all of the modifications necessary for the vehicle to run safely on ethanol will be completed by the first Friday in February.

The team is still investigating some final decisions, but everything is ready to go. We have a place to dyno our engine and are investigating school support for our own dyno.

January will be a very busy time!

Next Month: Team Bios

About

The Ethanol Vehicle Challenge is an engineering competition sponsored by the U.S. Department of Energy, Natural Resources Canada and General Motors. It goal is to convert a 1999 Chevrolet Silverado to run on 85% ethanol, while improving the performance and emissions.

The competition will begin at General Motor's proving ground in Milford, Michigan and conclude with a rally event to a place to be announced.

This is IIT's seventh automotive competition.

The project is one of IIT's Interprofessional Projects (IPRO). These are designed to bring real-life engineering to the classroom. They were developed to bring not only the different engineering disciplines but also business and law into a single project.

If you would like to be a sponsor of this exciting project and learn more, feel free to contact us at the below address. We will keep you informed of further PR events at our school and in the Chicagoland area.

SAE
10 W. 32nd St
Chicago, IL 60616
(312) 567-3172
E-mail:
sae@mmae.iit.edu

Illinois Institute of Technology

Student Chapter of

SAE INTERNATIONAL

Society of Automotive Engineers

Located in 020 Engineering 1 Building

JOIN

Joining is EASY; Come to 020 E1, contact x73172 or sae@mmae.iit.edu

More information on Joining

MEET

Friday @ 2 p.m.

Ethanol Vehicle Challenge and other activities for 99.

1999 SAE-IPRO Project:

Ethanol Vehicle Challenge

- The Ethanol Vehicle Challenge is an engineering competition sponsored by the U.S. Department of Energy, Natural Resources Canada and General Motors. It goal is to convert a 1999 Chevrolet Silverado to run on 85% ethanol, while improving the performance and emissions.
- The competition will begin at General Motor's proving ground in Milford, Michigan and conclude with a rally event to a place to be announced.
- This is IIT's seventh automotive competition.
- The project is one of IIT's Interprofessional Projects (IPRO). These

are designed to bring real-life engineering to the classroom. They were developed to bring not only the different engineering disciplines but also business and law into a single project.

The project is also an IPRO.

Sponsorship Opportunities

are available for IIT in the 1999 Ethanol Vehicle Challenge

Previous Projects

1998 Ethanol Vehicle Challenges: 1998 Chevrolet Malibu

.

1996 and 1997 Propane Vehicle Challenges: 1996 Dodge Grand Caravan LE

.

1991 Hybrid Electric Vehicle Challenge: Saturn SL2

.

1991 Natural Gas Vehicle Challenge: 1991 GMC Pickup 2500

.

Mini-Baja

.

Home Search Admission Feedback

Last Updated on January 29th by *Helen*

NEWS

Written by: Glenn Alford
Contact: Jody Finnegan (208) 236-4293

June 16, 1999

ISU FINISHES 11TH IN NATIONAL ETHANOL VEHICLE CHALLENGE

POCATELLO – Students from the Idaho State University College of Engineering finished 11th in the second annual National Ethanol Vehicle Challenge. In the challenge, student teams re-engineered Chevrolet Silverado pickup trucks to run on ethanol-based fuel and then drove them in a cross-country motorcade.

The competition was judged and points were awarded on a sliding scale in categories ranging from written design and oral presentations to emissions, cold-weather and off-road performance, acceleration, vehicle design inspection, fuel economy, and hill climb.

In a close competition ISU scored 504.9 points, just 85 points behind sixth-place Nebraska's 589.7, and won the Simon Vega Sportsmanship Award and a check for $500. The University of Illinois at Chicago won the challenge with 784.8 points, edging the University of Texas-El Paso's 778.7. Fourteen colleges and universities participated.

"Our vehicle ran very well," said Todd Gansauge, one of the ISU team's advisors. "We didn't even have to turn a wrench while other schools were madly making adjustments. We ran up against a deadline and didn't have time to fully optimize the truck's performance. Another couple of weeks' tuning would have made a big difference."

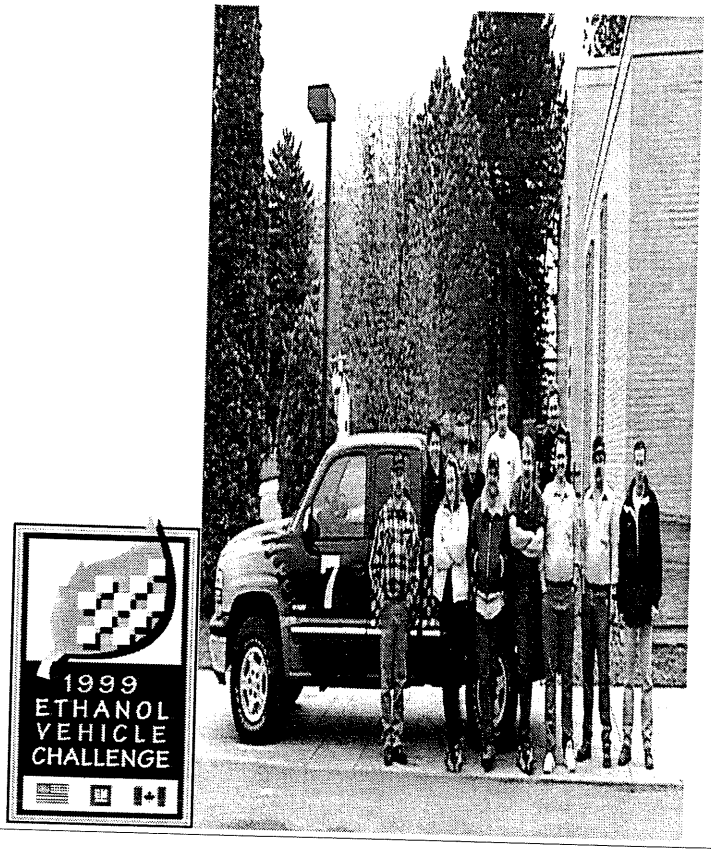
The ISU vehicle's smooth performance this year should carry over to the year 2000 challenge, which will take place in Canada. All competing schools will continue to work on the 1999 Chevrolet Silverado pickup trucks they entered in this year's challenge.

The Ethanol Vehicle Challenge gives students real-world engineering experience by offering them the opportunity to convert new vehicles built for gasoline into optimized vehicles fueled solely by E85, which is 85 percent ethanol and 15 percent unleaded gasoline. The goal is an ethanol-powered vehicle that achieves greater fuel economy and lower exhaust emissions, but has the driveability, performance and consumer appeal of a conventional gasoline vehicle.

"The students competing in this year's challenge showed even more creativity, enthusiasm and innovative applications of technical knowledge than expected," said Rick Scheidt, GM brand manager for Chevrolet Silverado. "We are excited about the long-term benefits of the Ethanol Vehicle Challenge and look forward to sponsoring next year's competition."

###

GOOD LUCK
ISU Team Ethanol!



ISU Engineering students are enthusiastically preparing for the 1999 Ethanol Vehicle Challenge (EVC) which will be held in May 1999 at the General Motors Proving Grounds in Milford, Michigan. The primary sponsors of the Challenge are the U.S. Department of Energy (DOE), General Motors Corporation (GM), and Natural Resources Canada (NRCan). The competition is administered by Argonne National Laboratory (ANL). The competition will be managed by the Truck Division at GM.

The objective of the 1999 EVC is to convert a Chevrolet Silverado to dedicated E85 (a mixture of 85 percent ethanol and 15 percent gasoline) operation. The competition truck, supplied by GM, was delivered to the ISU team in mid-November by Cole Chevrolet of Pocatello.

The Challenge is intended to encourage innovation in ethanol vehicle technology (specifically in terms of vehicle performance, emissions control, fuel economy, and cold starting); collect data to define the state of ethanol vehicle technology; and provide student engineers with a valuable hands-on learning experience in a real-life interdisciplinary engineering project.

This year's team is seeking support for their ethanol project. They anticipate a budget of around $20,000. Companies who donate $500 or more are eligible to have their company's logo displayed on the ISU Ethanol vehicle.

To find out more about the 1999 Ethanol Vehicle Challenge visit the official **EVC Competition website.**

1999 ISU EVC Team

	NAME	EMAIL
Team Captain	Steve Metzger	dermetz@netscape.net
Team	Gwen Gerkey	gerkgwen@isu.edu
	Stacey Evans	evanstac@isu.edu
	Sam Walton	
	Joseph Erickson	ericjose@isu.edu
	Justin Winter	wintjust@isu.edu
	Adam Ashley	
	Doug Harmon	
	Nicholas Hofeldt	
	Gabriel Tschikof	tschgabr@isu.edu
	T.J. Andrus	financhome@aol.com
	Paul Hirschman	hirspaul@isu.edu
Faculty Advisors	Todd Gansauge	gansauge@joule.isu.edu
	Dr. Jonathan Blotter	blotterj@isu.edu
	Kenyon Hart	hart@joule.isu.edu
	Miles Whiting	

1999 ISU EVC Sponsors

The ISU EVC students and advisors wish to gratefully thank the following sponsors for helping make this year's effort a reality.

- Idaho Department of Water Resources - Energy Division
- J.R. Simplot Company - Ethanol Production Plant
- Solutia, Inc.
- American Microsystems, Inc.
- ISU College of Engineering Advisory Council
- Walker Engineering
- B D Barnes & Sons Trucking
- D & S Electrical Supply
- Bailey Truck and Auto Supply
- Shaw Auto Parts
- North Main Radiator
- Automotive Supply
- Max Muffler
- Paxton
- Cole Chevrolet
- A&P Auto
- Radio Shack
- SLT Graphics
- Wild Things
- Amsoil
- L&M Machining

If you would like to know more about this year's ethanol project, please contact:
Dr. Jonathan Blotter
Faculty Advisor for Ethanol Team
P.O. Box 8060
Pocatello, ID 83209
(208) 236-4344
Fax (208) 236-4538

If you would like to become a sponsor of the 1999 ISU Ethanol Team, please contact:
Jody Finnegan
Student Services Coordinator
ISU College of Engineering
P.O. Box 8060
Pocatello, ID 83209
(208) 236-4293
Fax (208) 236-4538

1998 Ethanol Vehicle Challenge

Last year was the first year for the EVC competition. ISU's rookie team was recognized with a trophy and a $1000 check for "Most Innovative Component." The award was based on the ISU team's dual modification to their Chevrolet Malibu's ignition device and electronic control module, which was built to replace the factory device. The ignition device was a model airplane glow plug that replaced the standard spark plug. The plug provided the constant igniting power necessary to efficiently burn ethanol fuel in the altered ignition system, a task the car's original spark plug-ignited system was not able to handle. This device has similarities to a catalytic ignitor being developed by Aqualytic Technologies of Sandpoint, Idaho.

1998 ISU EVC Team

Team Captain	Steve Jeffers
Team	Bill Taylor
	Rodger Carpenter
Team Assistants	Stephen Anderson
	Mark Mills
	Eric Peterson
	Gwen Gerkey
	Jake Collins
	Students and Instructors from School of Applied Technology Automotive Tech Program
Faculty Advisors	Dr. Jonathan Blotter
	Kenyon Hart
Publicity Assistant	Jody Finnegan

1998 ISU EVC Sponsors

ISU wishes to extend its gratitude to the sponsors of the 1998 ISU EVC Team. Without them, participation would have been impossible.

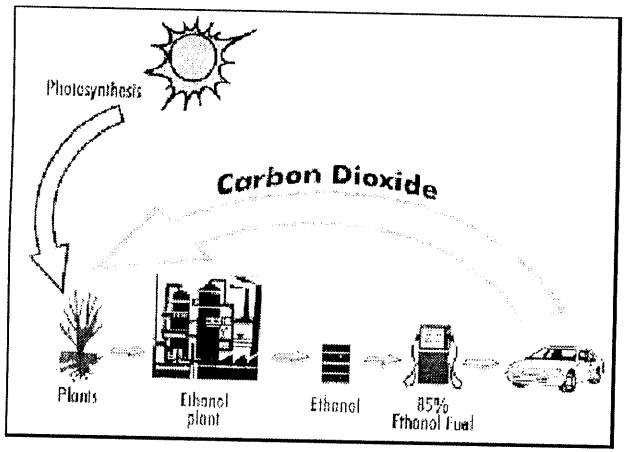
- Idaho Department of Water Resources - Energy Division
- FMC Corporation
- Solutia, Inc.
- L&M Machining
- ISU College of Engineering Advisory Council

HOME

Ethanol is Good for the Environment!

E85 is an alcohol–based fuel, consisting of 85% ethanol and 15% gasoline. Ethanol is domestically produced, clean burning, and is made from renewable resources such as corn and other grains, grasses, trees and agricultural residues. Presently, 12 percent of the nation's automotive fuel supply contains ethanol.

Ethanol can also reduce carbon dioxide, a major contributor to global warming. Much of the carbon dioxide that is released during the production and combustion of ethanol is recaptured by the plants that are used to produce more ethanol!



Source: National Ethanol Vehicle Coalition

Our Sponsors

Our sponsors include the U.S. Department of Energy, General Motors Corporation, Renewable Fuels Association, Governors' Ethanol Coalition.

Additional sponsorship has been provided directly to Kettering University from the following organizations: Michigan Biomass Energy Program, Classic Plating, Emitec Corp., Engelhard Corp., Vortech Engineering, Reichert Engines, Walboro, Delphi, Adrenaline, Torque Master, and Total Seal.

Kettering University

Kettering University, formerly GMI Engineering & Management Institute, "America's premiere co-op university" has a unique partnership that offers students, business, and industry an opportunity found at no other undergraduate university in America.

1700 W. Third Ave.
Flint, MI 48504
800/955-4464
www.kettering.edu

...Continuing the GMI Heritage!

This brochure was prepared with the support of the *Michigan Biomass Energy Program* and the *U.S. Department of Energy (DOE)* Grant Number CGLG-97-007.

ETHANOL

Fueling America's Future!

The story of Ethanol and Kettering University's Ethanol Vehicle Program

Kettering University

...Continuing the GMI Heritage!

Ethanol is Good for Your Car!

Ethanol is a high octane fuel preferred by racers! E85 has a high octane rating of 110 compared to gasoline's 87. Automobiles equipped to run E85 experience enhanced engine performance due to the reduction in the build-up of deposits. More than 2 trillion miles have already been driven on ethanol blended fuels!

E85 Benefits

- ✓ **Using E85 reduces harmful emissions making the air we breathe cleaner.**
- ✓ **Ethanol is a renewable resource because it is made from agricultural crops and waste products.**
- ✓ **Using E85 makes us less dependent on foreign oil because ethanol is made in America from crops grown by American farmers.**
- ✓ **No special training or knowledge is needed—E85 looks and fuels just like conventional gasoline.**
- ✓ **The range of a vehicle operating on E85 is excellent, you can drive more than 350 miles on an 18-gallon tank of fuel.**
- ✓ **There is no or a very low incremental cost to you on the purchase of an E85 vehicle.**
- ✓ **All E85 vehicles are proven reliable vehicles built as original equipment from the manufacturer and have the same warranties as gasoline vehicles.**

Source: National Ethanol Vehicle Coalition

Ethanol is Made in America!

Ethanol strengthens our national economy. The U.S. imports more than half of its oil. By keeping money in America, ethanol has already boosted employment by over 195,000 jobs (Northwestern University)! Further, it has improved the nation's balance of trade by $2 billion and resulted in a net federal budget savings of >$3 billion!

Ethanol Fueled Vehicles are Already Available!

You may already be driving a vehicle equipped for E85! Ford Motor Company and DaimlerChrysler Corporation both offer flexible fuel vehicles for sale! These vehicles are designed to run on any blend of gasoline and ethanol up to 85% ethanol, or E85.

Ethanol: The Time is Now!

Today there are more than 54 ethanol producers in 19 states. 1.5 billion gallons of ethanol is produced annually from 560 million bushels of grain. In fact, we already have 2 refueling sites located in Lansing and Detroit!

Ethanol is a domestically produced, renewable fuel. It is good for our environment! It is good for our economy!

Ethanol Vehicle Challenge

Kettering University is among 14 universities from N. America that will participate in this year's Challenge, which is sponsored by the U.S. Dept. of Energy, GM and Natural Resources Canada. The event runs during May 19-25, 1999, at General Motors Corporation's Milford Proving Grounds in Michigan.

"The Ethanol Challenge is a good way to simultaneously test a wide range of engineering configurations, all designed to optimize the performance of a dedicated E-85 vehicle," says Tom Gross, DOE's Deputy Asst. Secretary for Transportation Technologies. "At the same time, we are offering an incomparable training ground for tomorrow's automotive engineer."

Teams must modify their donated GMC Sierra or Chevrolet Silverado Truck trucks to run on E85 with the goal of increasing fuel efficiency and lowering exhaust emissions without sacrificing performance.

This is the 2nd year for Kettering University. In 1998, students converted a 1997 GM Malibu, winning Best Engine Emissions.

KU engineering students take on ethanol challenge with Jayhawk truck

The Chevy Silverado with the custom Jayhawk paint job will get your attention. It's what's under the hood that matters to the KU engineering students taking part in a national competition to explore new technology for using ethanol fuel blends.

Nine students developed KU's EVC truck. Pictured are (front left to right) Tim Martin, Ferran Ayala, Greg King, (in truck bed) Chris Runck and Andy Maurer. Not pictured are Terry Epp, Jon Eagleston, Scott Miller and Brad Shiver. Click on image to see a 589K version. Aaron Paden photo

The students, all University of Kansas mechanical engineering seniors, are currently at GM Proving Ground, in Milford, Mich., competing against 13 other North American universities and colleges in the 1999 Ethanol Vehicle Challenge, a program to optimize stock Chevrolet Silverado pickup trucks to run on E85, an 85 percent ethanol/15 percent gasoline blend.

"Our objective has been to develop a unique, practical design that has high tow capacity, outstanding acceleration capabilities and is environmentally safe," said team leader Tim Martin, Lenexa. Kan. Martin's younger brother, Robert, a sophomore in high school, is the artist behind the Jayhawk design, which extends from grill to tailgate.

Appearance is important in the competition, which began May 20, but it's not the only point teams are being judged on. Testing categories are technological advancements in engine design, emissions control, acceleration and engine performance, driveability, fuel economy and engine cold-start. Following the judging events, teams will embark upon a 600-mile road rally through the Midwest to demonstrate the capability of the vehicles. Competition winners will be announced at the awards ceremony, the final motorcade stop, in Springfield, Ill., on May 26.

This is the second year for the Ethanol Vehicle Challenge (EVC), sponsored by the U.S. Department of Energy, General Motors and Natural Resources Canada. In 1998, participating schools modified GM Malibu sedans to run on E85.

E85 has a higher octane rating than gasoline (110 compared to 89),so it burns cleaner. Using ethanol fuel releases fewer pollutants into the environment, thereby lowering ozone, carbon monoxide and benzene emissions. The fuel does have drawbacks, including its cold start characteristics and corrosive nature. Ethanol has trouble igniting below 40 degrees, which the KU team tackled with heated fuel rails that are activated when a computerized control system detects an ambient air temperature slightly above 40 degrees. The control system is activated when the driver's door is opened. Another aspect of the KU students' design was replacing engine components in constant contact with fuel with stainless steel or high-grade plastic. The team estimates that re-engineering the truck has cost $26,000.

The KU team is being sponsored in part by Duralite, the Governors' Ethanol Coalition, The Hoglund Foundation, Kansas Corn Growers Assoc., Kansas Corporation Commission, Kansas Grain Sorghum Commission, Kansas Grain Sorghum Producers Assoc., Kansas Technology Enterprise Corporation, Morse Chevrolet in Overland Park, Kan., and Dr. James Straight.

Nationally, the Challenge is sponsored by the U.S. Department of Energy, General Motors Corporation, Natural Resources Canada, State of Nebraska, Illinois Department of Commerce and Community Affairs, Council of Great Lakes Governors, Renewable Fuels Association, Illinois Corn Marketing Board, Governors' Ethanol Coalition, Williams Ethanol, and the Canadian Renewable Fuels Association. It is administered by Argonne National Laboratory.

Faculty sponsor of the KU EVC team is Robert Sorem, assistant professor of mechanical engineering. The team members, all mechanical engineering seniors, are:

Ferran Ayala, Coahuila, Mexico, in charge of cold start.
J. Terry Epp, Whitewater, Kan., in charge of cold start and fuel system. Epp is also pursuing a degree in business administration.
Timothy Martin, Lenexa, Kan., studying pre-law, in charge of team leadership, exhaust emissions and sponsorship.
Andrew Maurer, Shawnee, Kan., in charge of air induction and suspension modifications.
Gregory W. King, Stilwell, Kan., in charge of air induction, computer and controls and sponsorship.
Christopher J. Runck, El Paso, Texas, in charge of exhaust and emissions and suspension modifications.
Bradley Thomas Shyver, Stilwell, Kan., in charge of engine modifications, fuel system, sponsorship and public relations.
Jonathan Eggleston, Louisburg, Kan., in charge of computer and controls.
Scott Miller, Wichita, Kan., in charge of engine modifications.

Ethanol is a domestic fuel made from renewable materials primarily from corn and other grains but also waste materials from the food and beverage processing industries. Today, nearly 2 billion gallons of ethanol are produced annually in the United States and Canada. – by Prisella J. Adams

Visit the KU Ethanol Vehicle Challenge site.

Check out KU's Formula SAE racecar!

Return to the KU School of Engineering site.

UNIVERSITY OF CALIFORNIA
RIVERSIDE

UCR Engineering Students to Compete in 1999 Ethanol Vehicle Challenge May 19-23

News Advisory

UCR Engineering Students to Compete in1999 Ethanol Vehicle Challenge May 19-23

A team of engineering students at the University of California, Riverside will compete May 19-23 in the 1999 Ethanol Vehicle Challenge, a North American collegiate competition to convert gasoline-powered cars to run on cleaner burning E-85. The contest will be held at the General Motors Proving Ground in Milford, Mich.

UCR is the only California university and one of 14 universities in the U.S. and Canada selected to participate in the competition. During the five-day contest, each team will put its Chevrolet Silverado pickup -- converted to run on a blend of 85 percent ethanol and 15 percent gasoline -- through a battery of tests to measure emissions, acceleration, range, handling, energy efficiency and appearance. They will also be judged on the basis of a technical design report of their work.

Results of the competition will be announced on Tuesday, May 25.

Additional Background: Since November, a team of 14 students has been working at UCR's College of Engineering-Center for Environmental Research and Technology (CE-CERT) to modify a stock gasoline-powered full-size Chevrolet pickup to run on E-85. The alternative fuel has seen some use in the Midwest in farm equipment, light-duty buses and trucks and flexible-fuel vehicles.

Ethanol is made from domestic agricultural crops, including corn, and is based on sugars from starches and cellulose in the plants. As an alternative fuel, it produces fewer tailpipe emissions than conventional gasoline -- as much as 30 percent less carbon monoxide and 12 percent less volatile organic compounds, both principal contributors to air pollution.

The 1999 Ethanol Vehicle Challenge is one of several student engineering competitions sponsored by the U.S. Department of Energy which provide actual engineering experience to students while helping improve existing technology. In 1994, UCR students competing under the name Team CE-CERT won the first DOE-sponsored contest they entered, the Solar Two challenge to construct and operate a small-scale solar power plant.

Last year, the team posted the top score in the emissions reduction category of the ethanol vehicle competition and developed a patentable solution to the problem of cold-starting alcohol-based engine fuels, which burn poorly at temperatures below freezing. The UCR team placed fourth overall in the 1998 Ethanol Vehicle Challenge.

Co-captains of the UCR team for the 1999 competition are Mark Betty and Shaun McClure.

The U.S. Department of Energy, General Motors Corporation and other organizations sponsor the 1999 contest. The UCR team's project costs for materials, vehicle testing and travel have been offset by a number of sponsors who provided cash and in-kind gifts , including the South Coast Air Quality Management District, Detroit Diesel, Ford Motor Company, Johnson Machinery, the Northwest Riverside County Clean Cities Coalition, Coachella Valley Clean Cities Coalition, San Diego Valve and Fitting, Valin Industries, Wilcon Industries, Jorgensen Steel, Electronics Warehouse, MSD

Ignition, GEMS Sensors, and Phillips Chemical Co.

Among the other universities competing in the 1999 Ethanol Vehicle Challenge are the Illinois Institute of Technology, University of Kansas, University of Texas at Austin, University of Texas at El Paso and the University of Nebraska.

News Media Contact: Kathy Barton
(909) 787-2495
e-mail: barton@ucrac1.ucr.edu

CAMPUS WATCH

The Great Ethanol Challenge

UCR engineering team chosen for fuel conversion competition

A team of UCR engineering students has been selected to compete in the 1998 Ethanol Vehicle Challenge, a North American collegiate contest to convert gasoline-powered Chevrolet sedans to run on cleaner-burning E-85, a blend of 85 percent ethanol and 15 percent gasoline.

UCR was one of 14 teams from the United States and Canada selected for the competition, scheduled for next May at the General Motors Technical Center in Warren, Mich. During the weeklong finals competition, teams will put their converted vehicles through a battery of tests to measure emissions, acceleration, range, handling and energy efficiency. They will also be judged on the basis of a technical design report of their work.

The contest is jointly sponsored by the U.S. Department of Energy and General Motors.

About a dozen UCR students in the College of Engineering-Center for Environmental Research and Technology (CE-CERT) are working this academic year to design their modifications to a Chevrolet Malibu, perform the mechanical work required to convert the vehicle to E-85, and test the car before traveling to Michigan for the competition.

Ethanol is made from domestic agricultural crops, including corn, and is based on sugars from starches and cellulose in the plants. As an alternative fuel, it produces fewer tailpipe emissions than gasolineÑas much as 30 percent less carbon monoxide and 12 percent less volatile organic compounds.

The 1998 Ethanol Vehicle Challenge is one of several student engineering competitions sponsored by the U.S. Department of Energy which provide actual engineering experience to students while helping to improve existing technology. In 1994, UCR students competing under the name Team CE-CERT won the first DOE-sponsored contest they entered, the Solar Two Challenge to construct and operate a small-scale solar power plant, and last year the team competed in the Propane Vehicle Challenge to convert a gasoline-powered pickup to run on propane.

Among the other universities competing in the 1998 Ethanol Vehicle Challenge will be: University of Kansas in Lawrence, University of Nebraska in Lincoln and the University of Texas, El Paso.

Engineering students win contest with corn power

June 23, 1999

By Leila Belkora

Go to Press Release

UICNEWS

A team of UIC engineering students won the national 1999 Ethanol Vehicle Challenge May 26, demonstrating both their engineering prowess and the commercial promise of ethanol, a corn-based fuel.

More than 200 students from 14 colleges and universities competed in the contest, which is sponsored by the U.S. Department of Energy, Natural Resources Canada and General Motors.

The UIC team won first place overall, first place in fuel economy,best flame-arrestor design (to prevent flames from an external source from reaching the fuel tank) and tied for first place in emissions tests.

Government agencies and the automotive industry are interested in ethanol because it burns cleaner and is derived from corn, with the potential to reduce American dependence on foreign oil.

Much of the UIC team's success came from its dogged determination to reduce emissions and fuel consumption, said Brianno Coller, assistant professor of mechanical engineering. "That required a lot of painstaking tinkering with the engine on the part of the students," he said.

A catalyst provided by AlliedSignal, Inc., and a secondary air-injection system designed by the UIC team were keys to reducing emissions. The catalyst reduces all three components of emissions --hydrocarbons, carbon monoxide and oxides of nitrogen. The secondary air-injection system picks up unburned raw fuel that remains in the exhaust stream after combustion, reducing hydrocarbon emissions.

"With these two devices, we came up with a system that exceeds the California Low Emissions Vehicle standards," said UIC team leader Michael Svestka.

The team is particularly proud of its design for cold-starting the engine, he said. Ethanol is less volatile when cold, leaving the engine prone to hesitation when the driver first presses on the gas pedal.

"To get the engine to start at zero degrees Fahrenheit, we had to heat the air and the fuel," Svestka said.

To heat the air, the team arranged for it to flow over electrically heated coils, "kind of like those in your toaster, only magnified 10 times," he said.

They warmed the fuel by bringing it near engine coolant that had been heated during a previous engine run and stored in a kind of super-insulating thermos.

"It's great to win first place," said Svestka.

"The competition was very tight. We beat the second-place team by only six-and-a-half points out of a thousand."

Last fall, General Motors gave each team a Chevrolet Silverado pickup truck fueled by ordinary gasoline. Over the school year, working for hours a week on their own time, the students reengineered the trucks to run solely on E85 (85 percent ethanol and 15 percent gasoline primer).

The students and their faculty advisers also had to find sponsors to cover costs.

UIC's 12-member team, guided by Coller, raised well over $100,000 in supplies as well as cash.

Automotive Research Labs, Inc., of Harvey, provided emissions tests, while AlliedSignal Inc. donated experimental catalysts for use with the E85 fuel.

Ethanol was provided by the contest, available at Argonne National Laboratory and a gas station in Des Plaines.

In May, teams presented their designs to General Motors and Department of Energy officials, explaining how they confronted the inevitable design trade-offs. Judges examined the engines, rating them on craftsmanship and their potential use in a realistic production line.

The competition began in earnest May 19 at General Motors' Proving Ground in Milford, Mich.

Teams had to show a significant improvement in fuel economy and a reduction in exhaust emissions compared to conventional pickup trucks, while maintaining driveability, performance and consumer appeal.

The competition wrapped up with a 600-mile motorcade from Lansing, Mich., to Springfield, making stops at the state capitol buildings, the GM assembly plant in Fort Wayne, Ind., and the Williams Ethanol plant in Peoria.

UIC team members were Svestka, Phil Baranek, Andrew Chow, Brian Gorman, Patrick Barasa, Mirko Barbir, Justin O'Connor, Peter Probst, Robert Ruda, Giuseppe Sammartino and Christopher Gano.

News II Seminars II Faculty II Department || Research Labs II Grad. Programs
Undergrad. Programs || Job Openings || Contacting Us II Directions II UIC

UIC Mechanical Engineering Home

UIC Wins 1st Place Overall!

Chasing the Checkered Flag

Students Complete 2nd Annual Ethanol Vehicle Challenge

SPRINGFIELD, May 26 –Vehicles powered by ethanol-based fuel from fourteen colleges and universities crossed the finish line Wednesday, marking the end of the 1999 Ethanol Vehicle Challenge, sponsored by the Department of Energy (DOE) and General Motors. The competition challenges student teams to re-engineer Chevrolet Silverado pickup trucks to run on ethanol-based fuel and then drive them in a cross-country motorcade.

"These student teams are helping to develop the vehicles and fuels of the future," said Secretary of Energy Bill Richardson. "I am pleased that through efforts like the Ethanol Vehicle Challenge, we are able to help accelerate the development and performance improvement of alternative fuel vehicles."

The Ethanol Vehicle Challenge gives students real-world engineering experience by giving them the opportunity to convert new vehicles built for gasoline into optimized vehicles fueled solely by E85 (85 percent ethanol and 15 percent gasoline primer). The goal is an ethanol powered vehicle that achieves greater fuel economy and lower exhaust emissions, but with the driveability, performance and consumer appeal of a conventional gasoline vehicle.

"The students competing in this year's challenge showed even more creativity, enthusiasm and innovative applications of technical knowledge than expected," said Rick Scheidt, GM Brand Manager for Chevrolet Silverado. "We are excited about the long-term benefits of the Ethanol Vehicle Challenge and look forward to sponsoring next year's competition."

This year's winning team represented the University of Illinois at Chicago. All of the vehicles of top five teams met low emission vehicle (LEV) standards and many of the entrants produced ethanol vehicles that surpassed the on-road performance of their gasoline counterparts, signifying the marketability of E-85 fuel. Over 200 students from 14 schools competed for more than $21,000 in prizes, including $3,500 for first place overall.

Overall awards went to:

First Place - University of Illinois at Chicago

Second Place - University of Texas at El Paso

Third Place - Kettering University, Flint, Michigan

Fourth Place - University of Waterloo, Ontario, Canada

Fifth Place - Wayne State University, Detroit, Michigan

Two faculty advisors received $10,000 each for outstanding contributions to the program by inspiring their students and impacting their respective universities. Professor Charles Allport, Assistant to the Academic Vice President, Cedarville (Ohio) College, founded Cedarville's engineering department and has fielded many vehicle competition teams over the past several years. Dr. Ryan Wicker, Assistant Professor of Mechanical Engineering, University of Texas at El Paso, established a state-of-the-art laboratory and an automotive engineering course that supports the challenge.

Participating schools included:

- Cedarville College, Cedarville, Ohio
- Crowder College, Neosho, Missouri
- Idaho State University, Pocatello
- Illinois Institute of Technology, Chicago
- Kettering University, Flint, Mich
- Minnesota State University at Mankato
- University of California, Riverside
- University of Illinois at Chicago
- University of Kansas, Lawrence, Kan.
- University of Nebraska-Lincoln
- University of Texas at Austin
- University of Texas at El Paso
- University of Waterloo, Ontario, Canada
- Wayne State University, Detroit, Mich.

In addition to DOE, General Motors and Natural Resources Canada, support for this year's Ethanol Vehicle Challenge was provided by the following organizations: Illinois Department of Commerce and Community Affairs, State of Nebraska, the Council of Great Lakes Governors, Renewable Fuels Association, the Governors' Ethanol Coalition, the National Corn Growers Association, the Illinois Corn Marketing Board, the Canadian Renewable Fuels Association, Williams Ethanol, Delphi Automotive and Energy Systems, and Growmark.

This year's motorcade took students on a 600-mile journey from Lansing, Michigan to Springfield, Illinois. Stops were made at the State Capitol Buildings in Lansing and Indianapolis, the General Motors Assembly Plant in Fort Wayne, Ind., and the Williams Ethanol plant in Peoria, Ill. Next year's Ethanol Vehicle Challenge will take place in Canada with stops scheduled for Sarnia, Chatham, Toronto, Oshawa and Ottawa. The challenge teams will continue to optimize their E85 conversions of the 1999 four-wheel-drive Chevrolet Silverado pickup trucks.

News II Seminars II Faculty II Department || Research Labs II Grad. Programs
Undergrad. Programs || Job Openings || Contacting Us II Directions II UIC

UIC Mechanical Engineering Home

Home of the

CORVETTE

Current Date & Time

Time Left Until EVC 2000

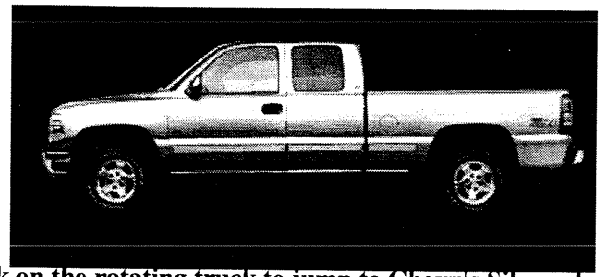
Days:Hours:Minutes:Seconds

In 1998, a group of student engineers from the University of Nebraska-Lincoln (UNL) participated in the first ever Ethanol Vehicle Challenge (EVC). The EVC is intended to encourage innovation in ethanol (E85) vehicle technology, collect data to define the state of ethanol (E85) technology, and provide student engineers with a hands-on learning experience in a real-life engineering project. The goal of the 1998 EVC was to convert a 1997 Chevrolet Malibu equipped with a 3.1L-V6 engine so that it would run on E85 fuel (85% denatured corn alcohol & 15% gasoline) and at the same time meet Ultra Low Vehicle Emission Levels while maintaining good driveability. Teams would also try to keep the modifications as simple as possible so that the vehicle would appear no different to the consumer. The 1998 EVC concluded with a trip to the General Motors Proving Grounds on May 26 - June 1 where UNL along with the 13 other colleges and universities from the US and Canada competed in various events. The events focused on vehicle emissions, cold- and hot-starting performance, design, fuel economy, driveability, acceleration, handling, and range.

Click HERE to learn more about the 1998 competition!

The vehicle for the 1999 Ethanol Vehicle Challenge will be the 1999 Chevrolet Silverado 4X4 (pictured below). The truck will be equipped with the Generation III, 5.3L-Vortec V8 engine. The rules for the 1999 EVC will be the same as 1998 except for a few changes. A timed off-road event will replace the slalom event from 1998, a loaded hill climb up a 7.2% grade will be performed towing a 7,000 lb. trailer, and emissions will be sampled at cold start. The 1999 Ethanol Vehicle Challenge will once again conclude at the General Motors Proving Grounds in Milford, MI on May 19-26, 1999.

Click HERE to learn more about the 1999 competition!



Click on the rotating truck to jump to Chevy's Silverado page

The "Cornvette" outside of Delphi Automotive Systems

The Silveado is back from GM and Car & Driver!

Upcoming Events...Come and check us out!

Kearney Cruise Nights...July 15, 16, 17

This year's EVC team has a lot ahead of them, and meetings are taking place weekly to develop team strategy. The teams and team leaders are shown below in the table. If you would like to help the team please contact one of the following people. The truck will be located in the Alternative Fuels Vehicle Shop (AFVS) at the corner of 17th and Y streets. Interested? Come check us out at the garage or come to one of the weekly meetings to see how you can help!

1999 EVC Team

Team	Team Leader	E-mail	Phone #
EVC Team	Scott Peterson	srpeters@unlgrad1.unl.edu	472-6389
Engine	Chet Dawes	00055196@bigred.unl.edu	474-5267
Controls	Arthur Hieronymus	00093905@bigred.unl.edu	472-5104
Materials	Jeff Nelson	00059375@bigred.unl.edu	477-1482
Cold Start	Matt Duncan	mrd3392@nwu.edu	488-8395
Emissions	Marc Meyer	daffy.duck1@usa.net	488-9019
Public Relations	Clark Otte	GrizzatUNL@aol.com	435-7738
Faculty Advisor	Dr. William Weins	wweins@unlinfo.unl.edu	472-3088
Meetings:	Wednesdays at 5:30 PM in WSEC 318		

Created and edited by: Clark Otte
Page was last updated on 07/11/99

Winter 1999

Happenings

THE VOICE OF THE UNIVERSITY OF WATERLOO ALTERNATIVE FUELS TEAM

WE'RE RUNNING ON ETHANOL!!

The winter term has been a busy one for UWAFT and with the 1999 Ethanol Vehicle Challenge less than three months away, it's not going to change any time soon! January marked the coming together of both co-op streams at Waterloo and as a result all 1999 team members are finally on campus together. With the fuel system conversion just recently completed, we're happy to be running on ethanol and eager to optimize the performance of our truck.

For the 1999 EVC there are several additional challenges to be met beyond those posed by the 1998 EVC. A tow/haul competition and an off-roading event have been added since truck performance is so closely linked with consumer appeal. This year emissions testing is going to be included during the cold start event as well, forcing us to address two key elements at once.

As we have in the past, UWAFT is focussing on emissions and cold start for 1999. We are also aiming for a first place finish at the 1999 EVC to add to our team's accomplishments. This will, of course, require dedication and ingenuity from all team members to create a well-balanced design which truly illustrates the viability of E-85 as an automotive fuel. This may seem a rather daunting task, but what would be better suited to a group of fifteen engineering students from the University of Waterloo? Some specific examples of our strategies for this year can be seen throughout this issue of Happenings.

Naturally, winning the 1999 Ethanol Vehicle Challenge in May is not something that UWAFT can accomplish alone. UWAFT relies heavily upon industry for technical and financial support. Many different types of sponsorship are required to realize the full potential of this project. This is why UWAFT strives to create unique and mutually beneficial arrangements with all of our sponsors.

It is my sincere wish that you enjoy this update from UWAFT. We are very pleased to be involved in finding engineering solutions to such a pertinent real world problem and to be sharing this undertaking with our community.

Nicole Dufour, 1999 Team Captain

Technical Update

The overall task of converting the vehicle to an ethanol-driven one has been split into four separate sub-tasks: fuel delivery system, engine system, exhaust system, and controls system. A leader for each sub-task has been chosen and they are all actively investigating new technologies for their area. Each leader has summarized some of their ideas below.

Fuel Delivery System

The truck has been fully converted and is now running on ethanol. There is still more work to do to make the fuel system completely reliable and optimize the vehicle's performance:

- The fuel flow rates and pressure are being calibrated to optimize the emissions and cold-start performance.
- Temporary flame arrestors have been installed on the fuel tank and will be replaced with permanent ones. GM has made the design of the flame arrestors part of the challenge, and points will be awarded for their design in the Design Judging event.
- This year, the cold-start testing will be done at -20°C (-4°F) and emissions will be tested as part of this event. Because of the extreme cold temperature of this event, several methods are being considered for preheating the fuel before it is injected into the cylinders. This will improve cold-start fuel vaporization.

Engine System

The proposed engine modifications are as follows:

- To take advantage of E85's high octane rating, the compression ratio of the engine will be increased by machining down the cylinder heads.
- A cooler will be added to the EGR system on the vehicle to increase the mass flow of re-circulated exhaust gases. It will also mean that the re-circulated gases will be cooler and help to lower the combustion temperature inside the cylinders, leading to lower emissions. The system will be tested and calibrated to give the greatest reduction of harmful emissions.
- The cylinder heads will be machined and valves multi-angle ported to increase the velocity of the intake air and improve the volumetric efficiency.
- The air intake manifold may be modified to accommodate use of a previously tested 'heated coolant' system. This will help in increasing the temperature of the intake air during cold starting.
- The use of a digital supercharger is being investigated to improve performance at certain points of operation of the engine.
- Additional modifications will be implemented, including changing the lubricant to a fully synthetic oil to improve performance characteristics.

Control System:
Recently GM announced that the schools participating in EVC'99 will be allowed access to the tables in the PCM dealing with starting and open loop operation. This news has allowed the UWAFT controls team to refocus their efforts solely on improving cold start and emissions. A few key points:

- The PCM is currently being reprogrammed to reduce the amount of time required for open loop control.
- Using the ability to reprogram the PCM in conjunction with UWAFT's cold start controller will allow us to experiment with different cold start strategies.
- An improved electrical system will be installed into the vehicle to operate the cold start system. The key to this system is ensuring the cold start strategy does not load the engine during open loop operation.

Exhaust System:
The challenge is to reduce the harmful emissions during the open loop cycle after the engine is started. The key items are:

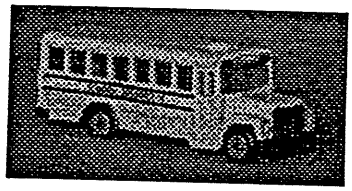
- E85-specific three-way main catalyst
- E85-specific pre-catalyst
- Fast light off oxygen sensors
- Digital EGR cooler
- Extensive emissions testing allowing iterative design improvement and technical data for team design report
- Other considerations such as thermal wrap, structural modifications, etc.

Promotional Events

National Engineering Week 1999

As part of National Engineering Week, UWAFT's award-winning E85 Malibu was displayed from Feb. 27 to Mar. 7 at the Canadian National Museum of Science and Technology in Ottawa.

Bus Push '99



Every winter term, Waterloo Engineers raise money for the local chapter of the Big Sisters with a Bus Push. This year, a UWAFT vehicle will lead the way!!

Zigge zagga, zigge zagga, hoi hoi hoi!!

Oktoberfest Mascot "Onkle Hans"

Arrangements are underway to include UWAFT's E85 Silverado in the 1999 Kitchener-Waterloo Oktoberfest Parade, coming up this October.

Acknowledgements

UWAFT would like to thank all the companies and organizations that have provided us with technical and financial sponsorship. It is with this support that we were able to be so successful in previous competitions and hope to be victorious in the future.

Big Dave's Auto Parts
Canadian Renewable Fuels Association
Centaur Thermal Systems
Commercial Alcohols
CrossFlow Corp.
Degussa Corporation
Downtown Auto Center
Environment Canada
Iogen Corporation
Long Manufacturing
Midas Muffler and Brake Shops
NCR Corporation
Nett Technologies
NGK Spark Plug Co.
Niagara Valve and Fitting
Quad Engineering
Ontario Corn Producers Association
Ortech Corporation
Rudy Held Performance Centre
Steve Scherer Pontiac Buick GMC Ltd.
Thermotech Engineering
University of Waterloo Department of Mechanical Engineering
Waterloo Engineering Endowment Fund
Wallaceburg Collision

Contact UWAFT

UWAFT would like to be able to answer any questions that you have regarding the development of our ethanol vehicle, or any other issue. We are always eager to talk about our initiatives.

UW Alternative Fuels Team
Department of Mechanical Engineering
University of Waterloo
Waterloo, Ontario
N2L 3G1

Phone: (519) 885-1211 Ext.6208
Fax: (519) 888-6197

E-mail: uw_aft@engmail.uwaterloo.ca

Internet Web Site:
http://www.eng.uwaterloo.ca/project/uw_aft

Faculty Advisor: Prof. Roydon Fraser

1999 Team Captain: Nicole Dufour

U·W·A·F·T

University of Waterloo Takes Second Place
Wins Lowest Emissions Award in 1998 Challenge
Meet the Team

Ethanol Vehicle Challenge - University of Waterloo
Kneeling (l to r): Roydon Fraser (faculty advisor), Joe Krajnc, Justin Kropp, Dave Mather. Standing (l to r) Jason Yi, Dave Woodruff, Oliver Hsiang, Mike Pelton, Cam Walters, Jared Lundy, Rishi Gautum.

The Team's Home Page

After a week of high intensity competition at the General Motors Proving Grounds in Milford, Michigan, the awards were presented for the 1998 Ethanol Vehicle Challenge. Out of 14 teams from across North America that competed, the University of Waterloo gave Canada an excellent finish, just behind first place Wayne State University of Michigan. The talented Waterloo crew also received the top award for having the vehicle with the lowest emissions.

It took 14 months for competing colleges and universities to complete re-engineering a 1997 Chevrolet Malibu to run on E85 (85% ethanol and 15% gasoline). The cars were provided by General Motors Corporation, one of the three principle sponsors of the event, which also included the U.S. Department of Energy and Natural Resources Canada.

The top six teams of the 14 entrants were given placings. The top six places went to:

1998 ETHANOL VEHICLE CHALLENGE RESULTS

1st Place	**Wayne State University, Michigan**
2nd Place	**University of Waterloo, Ontario**
3rd Place	**University of Illinois, Chicago**
4th Place	**University of California, Riverside**
5th Place	**Cedarville College, Ohio**
6th Place	**Illinois Institutue of Technology**

INDIVIDUAL TEAM AWARDS

Simon VEGA Sportsmanship Award	**Cedarville College, Ohio**
Best Teamwork Award	**University of Nebraska, Nebraska**
Best Skit Award	**University of California, Riverside**
Best Acceleration	**Wayne State University, Michigan**

Best Handling	**Mankato State University, Minnesota**
Best Engine-Out Emissions	**Kettering Institute of Technology, Michigan**
Best Vehicle Appearance 1st Place	**Mankato State University, Minnesota**
Best Vehicle Appearance 2nd Place	**University of Nebraska, Lincoln**
Cold Start Performance	**University of Illinois, Chicago**
Most Innovative Component	**Idaho State University, Idaho**
Best Oral Presentation	**University of California, Riverside**
Lowest Emissions	**University of Waterloo, Ontario**
Best Fuel Economy	**Wayne State University, Michigan**
Best Ethanol Conversion	**Mankato State University, Minnesota**

Speaking on behalf of the US DOE, Tom Gross, Deputy Assistant Secretary for Transportation Technologies at the US DOE, said, "Never before have we been so concerned with greenhouse gas emissions. Using ethanol in place of gasoline would reduce the impact of transportation on global warming. Student teams that have participated in the Ethanol Vehicle Challenge will increase the potential contributions of ethanol even more by improving the fuel economy and emissions characteristics of these vehicles. The Department of Energy is proud to have joined with General Motors Corporation, Natural Resources Canada, and all of the other sponsors, to help make this event a tremendous success."

Dennis R. Minano, General Motors Vice President of Public Policy, and Chief Environmental Officer, said, "General Motors is keenly interested in the continued development of alternatively fueled vehicles. The Ethanol Vehicle Challenge not only provides an opportunity to work with many highly motivated students, but also contributes significantly to a better understanding of the use of ethanol as a motor fuel. Congratulations to all of the teams on their tremendous effort."

Among the primary sponsors of the Challenge was Natural Resources Canada, Bryan Cook, Director of NRCan's Energy Technology Brach, who said, "Canada is committed to continued research and development for alternative fuels and to promoting a strong science and technolo_y culture in youth. We are very impressed with the ingenuity, dedication, and hard work, demonstrated by these students and are proud to have been a sponsor."

The Ethanol Vehicle Challenge is an event in which top North American engineering students compete to determine who can implement the best dedicated ethanol E-85 conversion based on emissions, performance, fuel economy and overall quality of design.

Canada's entry, and returning 1997 Champion, is the University of Waterloo. The U. of W. ethanol team from the Department of Mechanical Engineering will use their talents and innovation to customize a new 1998 Chevrolet Malibu for E-85. The Canadian Renewable Fuels Association has joined the growing number of sponsors for the Ethanol Vehicle Challenge, or direct support for the University of Waterloo Ethanol Team.

The competition is sponsored by General Motors, Natural Resources Canada, and the United States Department of Energy. By sponsoring this event, these organizations challenge engineering students with real world problems, while sending a message that an engineering education can help to solve pressing global issues.

But perhaps the greatest benefit of this event is that it serves to raise awareness about the potential for alternative fuels such as ethanol. We wish them well in their challenge and look forward to the results in Washington.

1999 Sponsors of the Waterloo Team

- Canadian Renewable Fuels Association
- Ontario Corn Producers' Association
- Commercial Alcohols Inc.

If you would like to sponsor the University of Waterloo 1999 Ethanol Vehicle Challenge Team contact: Jill Vickers,University of Waterloo at (519) 888-4567 (ext. 6208)

1999 Challenge Sponsors and Supporters

- Canadian Renewable Fuels Association
- General Motors Corporation
- Governor's Ethanol Coalition
- Natural Resources Canada
- U.S. Department of Energy
- U.S. National Corn Growers' Association
- U.S Renewable Fuels Association

1999 Challenge Administrators

Centre for Transportation Research
Argonne National Laboratories
University of Chicago

Wayne State's Team Ethanol fine tunes entry for 1999 Ethanol Vehicle Challenge May 19

Wayne State University's Team Ethanol is approaching crunch time as it prepares for the 1999 Ethanol Vehicle Challenge which opens Thursday at the GM Proving Ground in Milford. The engineering students on the 26-member team have been working diligently to defend the national title last year's team earned.

"God rested on the seventh day; we didn't," said team member Greg Schroeder.[YEAR, DEPARTMENT] Schroeder spent nearly 60 hours last week helping make last-minute modifications on the team's 1999 Chevy Silverado. Wayne State is one of 14 schools throughout the United States and Canada returning to the second annual competition. Last fall, the teams received a 1999 Silverado donated by General Motors that they have re-engineered to run on a blend of ethanol fuel.

Despite early complications organizing the expanded team -- last year's team consisted of 10 members -- team captain Denise Rizzo said the team has outperformed her expectations. "This has been one of the greatest challenges I have faced as a student," said Rizzo. "But everyone in the group put in a lot of hard work and pulled together to work as a team."

Rizzo added that there was a tremendous amount of pressure for the team to repeat last year's showing. Last year's team converted a 1997 Chevy Malibu to E-85 (a blend of 85 percent ethanol and 15 percent gasoline) without sacrificing fuel economy or performance. In the process, they placed first among the 14 teams and bragging rights for an entire year.

-more-

As it was in 1998, the 1999 Ethanol Vehicle Challenge is being sponsored by the U.S. Department of Energy, the General Motors Corp., Natural Resources of Canada, and various others.

This year the team converted the Silverado—which has a 5.3 liter, V-8 engine—to run on E-85. In addition to increasing fuel mileage by nearly 15 percent, Team Ethanol's re-engineered Silverado is expected to gain 30 more horsepower than the 270 horsepower the engine is rated for, said team members. E-85 is a clean-burning, renewable fuel. Ethanol is a domestic fuel derived from a biomass of agricultural and waste products, including corn, sugar cane, potatoes as well as waste from paper, brewery and food processing industries.

Ethanol vehicles have already been produced in a limited run by the Ford Motor Co., and are being utilized in government fleets.

The teams will bring their entries to the GM Proving Ground in Milford for four days of intensive testing from May 19 through 23. The Silverados will be evaluated for engine design, emissions, driveability, fuel economy, acceleration, cold-start and appearance. Following the testing, the 14 teams will embark on a 600-mile journey through the Midwest.

Opening ceremonies and media day will take place Thursday, May 20 at 1 p.m. Road tests will be Sunday, May 23 beginning at 7 a.m. For more information and entry passes, please call [PHONE NUMBER OF EVENT COORDINATOR]

-end-

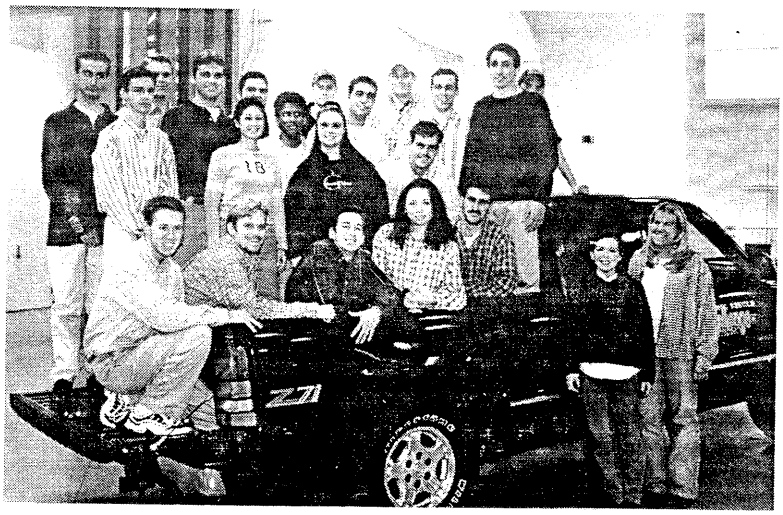
COLLEGE OF ENGINEERING

WAYNE STATE UNIVERSITY

news

Contact: David Reich
communications office
College of Engineering
Wayne State University
(313) 577-6531 (voice)
7-5300 (fax)

New Team Ethanol Wayne State prepares to defend national title



With a new crop of engineering students and a 1999 Chevrolet Silverado pickup replacing last year's Chevy Malibu, about the only thing resembling last year's national champion team is their name, Team Ethanol Wayne State.

Perhaps the biggest challenge to this year's young and mostly inexperienced team is internal communications. With 26 team members, Team Ethanol is more than twice the size of last year's team whose members have all graduated and gone on to take automotive engineering jobs.

Nonetheless, Team Ethanol is determined to defend Wayne State's first place title at this year's Ethanol Vehicle Challenge sponsored by the General Motors Corp., the U.S. Department of Energy, and Natural Resources Canada.

Last June's success -- Wayne State showed how a stock 1997 Chevy Malibu can be converted to an ethanol fueled vehicle without sacrificing fuel economy and performance -- brought the College of Engineering outside attention, a boost in administrative support to team projects, and a lot of students interested in getting involved.

Derek Compton, a mechanical engineering major at the College of Engineering, is typical of those who joined the new team. "I heard about how well last year's team did and it sounded like something I wanted to do," said the 23-year-old senior.

Because General Motors belatedly made the decision to put on another competition in late October, the new team did not receive their brand new green Silverado until November 16. General Motors donated a 1999 Silverado to each of the 14 universities from across the country that are returning for the competition's second year.

-more-

The new team's first steps were to develop an organizational chart and to divide the students into five groups – an engine group, a vehicle conversion group, a dynamometer group, a cold start group, and an ECU (electronic control unit) group. "The team captains meet once a week and return to their groups to discuss what went on (with the others)," said Mr. Compton, who heads the cold start group.

The team was hoping to get the Silverado engine mounted in the lab, hooked up to the dynamometer, and running on ethanol by the first of the year, said senior Kim Duda, Team Ethanol's co-captain. Its first technical task in December was to get measurements off the engine.

With a different vehicle, Team Ethanol will need to come up with their own engineering solutions; not last year's. Last year, Team Ethanol, led by Paul Nahra, used a special intermediate coil heater to help cold start the engine. The custom device will not work on the 1999 Silverado which has a plastic intake manifold.

Unlike last year's mostly handpicked team, participation was open this time to all engineering students who could demonstrate the strong commitment needed for the project. As a result, many freshmen and sophomores without industry intern or Coop experience joined the team.

This year's team will be advised, however, by four of last year's team members who are pursuing graduate studies, including Mr. Nahra.

The team already has an impressive start in financial support. The College of Engineering has contributed $5,000 to the project. The team also has the $4,000 in prize money received by last year's team. In addition, WSU President Irvin D. Reid recently announced that the University will kick in $5,000. With an additional $2,500 expected from the Engineering Alumni Association, and the continued support of last year's sponsors, Team Ethanol has already reached last year's income without beginning their own fundraising.

Ms. Duda said, however, that this year's team has set a goal of $100,000, compared to the $20,000 raised last year. That kind of support compares to the financial backing expected again by such competing schools as the University of Nebraska and the University of California at Riverside.

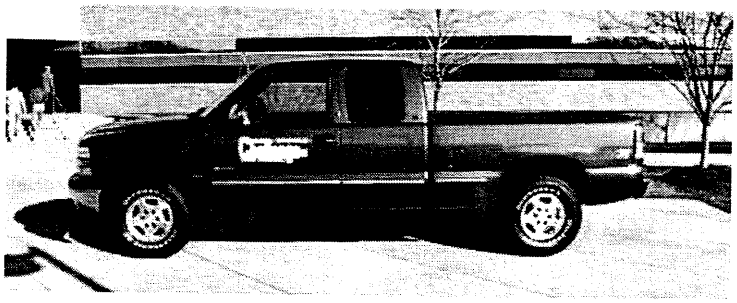
The staging of this year's events will again take place again at the GM Proving Ground in Milford, Mich., but the exact dates in late May or early June have not been set yet.

-30-

WAYNE STATE UNIVERSITY
Team Ethanol

What is the Ethanol Vehicle Challenge?

For the second year, student teams from across the United States and Canada will compete in the Ethanol Vehicle Challenge using donated vehicles they have converted to run on E-85, an alternate fuel made of 85% ethanol and 15% gasoline. In the 1999 competition, each school will convert a 1999 Chevy Silverado, shown below.



Our team's goals:

- To increase fuel efficiency by 33% (final conversion of 25+ mpg highway).
- To obtain ULEV standards in emissions.
- To start the Silverado in less than 3 seconds in 20°F conditions.
- To finish 7th or better in all of the remaining categories.

The converted Silverado will be judged in the following categories:

- Exhaust Emissions
- On-Road Fuel Economy
- Cold-Start
- Driveability
- Solo Evaluation
- Written Design Report
- Oral Presentation
- Design
- Sound
- Acceleration
- Hill Climb/Trailer Pull

The seven-day competition will take place May 19-25, 1999 at the General Motors Corporation in Michigan. For more information on the 1999 Ethanol Vehicle Challenge, check out Argonne Transportation's Ethanol Vehicle Challenge page.

Ethanol Challenge competitors display vehicles at Detroit auto show
January 18, 1999

Three competing schools in the 1999 Ethanol Vehicle Challenge joined forces in downtown Detroit this month as they engaged the public attending the 1999 International Auto Show at the Cobo Hall conference center.

The three schools -- Wayne State University, Kettering University, and Cedarville College-Ohio – along with 11 others in the U.S. and Canada, are working against a late June deadline to convert their 1999 Silverado pickups to ethanol power for the Challenge scheduled at the GM Proving Grounds in Milford, Mich.

Students and support staff from the three schools displayed their cars side by side at the Detroit auto show, which ran January 9 through18 in a section of the show reserved for alternative fuel vehicles. Wayne State University, winner of the 1998 Ethanol Vehicle Challenge, showed its champion re-engineered 1997 Chevy Malibu. Kettering also brought its 1997 Chevy Malibu, while Cedarville, which placed 5th in last year's competition, opted to bring the Silverado.

Cedarville traveled the farthest among the three schools, using its 1998 Chevy Malibu to shuttle teams of student volunteers from its campus three and a half-hours away east of Dayton, Ohio. Wayne State is located close to downtown Detroit, while Kettering is in Flint, Mich. north or Detroit.

While the students mingled and shared mutual experiences, no one was eager to divulge plans or technical information about what their team is doing to convert their competing vehicles, said Kim Duda, a co-captain on the 1999 Wayne State team.

Cedarville has already performed some physical improvements to its Silverado. Using its website to solicit sponsors, the team installed a sleek hard cover to the bed of its truck.

David Reich
Communications Manager
College of Engineering
Wayne State University

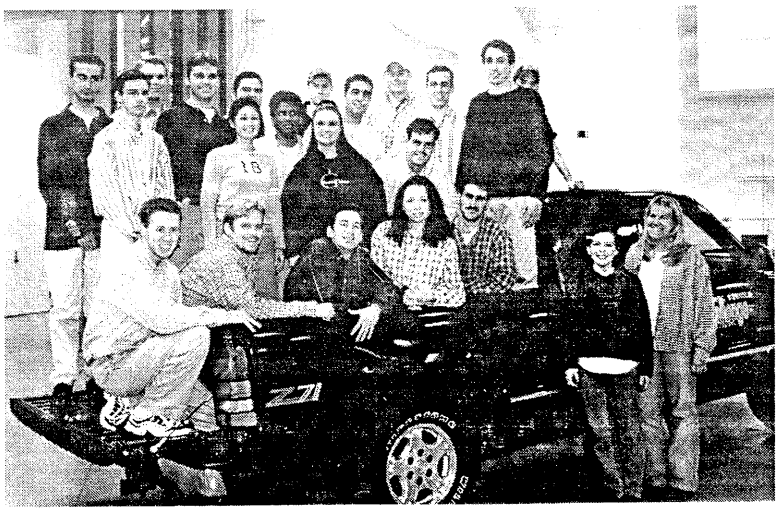
COLLEGE OF ENGINEERING

WAYNE STATE UNIVERSITY

news

Contact: David Reich
communications office
College of Engineering
Wayne State University
(313) 577-6531 (voice)
7-5300 (fax)

New Team Ethanol Wayne State prepares to defend national title



With a new crop of engineering students and a 1999 Chevrolet Silverado pickup replacing last year's Chevy Malibu, about the only thing resembling last year's national champion team is their name, Team Ethanol Wayne State.

Perhaps the biggest challenge to this year's young and mostly inexperienced team is internal communications. With 26 team members, Team Ethanol is more than twice the size of last year's team whose members have all graduated and gone on to take automotive engineering jobs.

Nonetheless, Team Ethanol is determined to defend Wayne State's first place title at this year's Ethanol Vehicle Challenge sponsored by the General Motors Corp., the U.S. Department of Energy, and Natural Resources Canada.

Last June's success -- Wayne State showed how a stock 1997 Chevy Malibu can be converted to an ethanol fueled vehicle without sacrificing fuel economy and performance -- brought the College of Engineering outside attention, a boost in administrative support to team projects, and a lot of students interested in getting involved.

Derek Compton, a mechanical engineering major at the College of Engineering, is typical of those who joined the new team. "I heard about how well last year's team did and it sounded like something I wanted to do," said the 23-year-old senior.

Because General Motors belatedly made the decision to put on another competition in late October, the new team did not receive their brand new green Silverado until November 16. General Motors donated a 1999 Silverado to each of the 14 universities from across the country that are returning for the competition's second year.

-more-

The new team's first steps were to develop an organizational chart and to divide the students into five groups - an engine group, a vehicle conversion group, a dynamometer group, a cold start group, and an ECU (electronic control unit) group. "The team captains meet once a week and return to their groups to discuss what went on (with the others)," said Mr. Compton, who heads the cold start group.

The team was hoping to get the Silverado engine mounted in the lab, hooked up to the dynamometer, and running on ethanol by the first of the year, said senior Kim Duda, Team Ethanol's co-captain. Its first technical task in December was to get measurements off the engine.

With a different vehicle, Team Ethanol will need to come up with their own engineering solutions; not last year's. Last year, Team Ethanol, led by Paul Nahra, used a special intermediate coil heater to help cold start the engine. The custom device will not work on the 1999 Silverado which has a plastic intake manifold.

Unlike last year's mostly handpicked team, participation was open this time to all engineering students who could demonstrate the strong commitment needed for the project. As a result, many freshmen and sophomores without industry intern or Coop experience joined the team.

This year's team will be advised, however, by four of last year's team members who are pursuing graduate studies, including Mr. Nahra.

The team already has an impressive start in financial support. The College of Engineering has contributed $5,000 to the project. The team also has the $4,000 in prize money received by last year's team. In addition, WSU President Irvin D. Reid recently announced that the University will kick in $5,000. With an additional $2,500 expected from the Engineering Alumni Association, and the continued support of last year's sponsors, Team Ethanol has already reached last year's income without beginning their own fundraising.

Ms. Duda said, however, that this year's team has set a goal of $100,000, compared to the $20,000 raised last year. That kind of support compares to the financial backing expected again by such competing schools as the University of Nebraska and the University of California at Riverside.

The staging of this year's events will again take place again at the GM Proving Ground in Milford, Mich., but the exact dates in late May or early June have not been set yet.

-30-

Send-Off Event

Hosted by the
Governors' Ethanol Coalition Chair
Kansas Governor Graves

GM Car Plant
Fairfax, Kansas

File

STATE OF KANSAS

BILL GRAVES, GOVERNOR
Alice A. Devine, Secretary of Agriculture
901 S. Kansas Avenue
Topeka, Kansas 66612-1280
(913) 296-3558
FAX: (913) 296-8389

KANSAS DEPARTMENT OF AGRICULTURE

May 10, 1999

Mr. Eli Bryant and Mr. Art Boyt
Crowder College
601 LeClede Avenue
Neosho, MO 64850

Dear Mr. Bryant and Mr. Boyt:

Thank you for the time and effort you devoted to planning for the May 17th Ethanol Vehicle Challenge event in Kansas City.

We had looked forward to honoring the students and showcasing their vehicles and teams from several schools at the May 17 event with the Fairfax General Motors Plant whose staff had graciously agreed to host the event. Unfortunately, however, recent national events have made it necessary for Governor Bill Graves to attend the National Education Summit in California at that same time.

Without the availability of the Governor, who is chairman of the Governors' Ethanol Coalition, a public event became less feasible ultimately forcing cancellation of the event.

Again, thanks for your willingness to cooperate with this demonstration of ethanol-fueled vehicles. I look forward to working with you in the future and seeing the vehicles at the awards ceremony in Springfield on May 26th.

Sincerely,

Greg Krissek
Assistant Secretary

1999 Ethanol Vehicle Challenge Kickoff Event with 1999 GEC Chair - Kansas Gov. Bill Graves

When: May 17, 1999 2:00PM

Where: GM Plant - Fairfax - Kansas City, Kansas

Why: To give Gov. Graves as GEC Chair a chance to visit several teams as they travel to the challenge at Milford Testing grounds.

Teams confirmed to attend - Univ. of Nebraska/Lincoln
Univ. of Kansas
Crowder College
Idaho State Univ.

What: Teams and their vehicles - 1999 Chevy Silverado Extended Cab 4x4 trucks

Event Contacts:

KDA	Greg Krissek/Carole Jordan/Trent LeDeux
KS Corn Growers/ KS Grain Sorghum Producers	Sue Schulte/Jere White
GM	George Turner

Others to invite:
KU Engineering School Public Affairs
KC Chamber - Ag Committee
KCK Chamber
Kansas Corn and Grain Sorghum Commissions
Ag Hall of Fame Board
Wyandotte County Farm Bureau
Kansas Ethanol Producers
Kansas Corporation Commission/Alternative Fuels Section
Kansas Dept. Of Commerce + Housing
Other sponsors of KU EVC team

Media to invite:
Ag press
Automotive press
KC media/KC Business Journal

Tentative Schedule of Events
May 17, 1999
2:00PM
GM Fairfax Plant

Competition Overview/Introduction of Guests and Governor
Greg Krissek/Asst. Secretary KDA

Governor's Remarks
possible topics - welcome and encourage students

GM Representative?
Describe truck competition

Introduce teams/captains/faculty advisors
invite media and guests to meet the students and ask for project descriptions

Invite the Governor to drive one of the Silverado's - KU?

Media and guest interview students/teams

Event concludes 3:00PM

DRAFT

1999 Ethanol Vehicle Challenge Kick-Off

Kansas Governor Bill Graves, Chair of the Governors' Ethanol Coalition, will host a press conference to kick-off the 1999 Ethanol Vehicle Challenge, an North American event sponsored by the U.S Department of Energy, General Motors Corporation, and Natural Resources Canada with contributing support by the Governors' Ethanol Coalition.

Five of the fourteen schools participating in the competition will meet at the GM Car Plant in Fairfax, Kansas (greater Kansas City) for a send-off by Governor Graves before they join nine other teams at the GM Proving Ground in Milford, Michigan. The five teams will display their newly modified 1999 Silverado 4x4 pick-up trucks at the plant and discuss their pursuit to improve fuel economy, cold-start, and power in E85 vehicles.

For the past 7 months, student teams have been optimizing their Chevy trucks to run on E85. Trucks will be tested on engine design, emissions, driveability, fuel economy, acceleration, cold-start and appearance. Following the testing at the GM Proving Grounds, teams will embark on a 600-mile journey through the Midwest including stops in Lansing (MI), Fort Wayne (IN), Indianapolis, Peoria and Springfield (IL).

Date: May 17, 1999
Time: 2:00-3:00 pm
Where: GM Car Plant - Fairfax, Kansas (greater Kansas City)
Participating Teams: Crowder College, University of Kansas, University of Nebraska, Idaho State University, and University of Texas at El Paso

For more information contact: Greg Krissek (?), KS Department of Agriculture, 785-296-3558

DRAFT

May 5, 1999

Honorable [Governor]
Governor of [state]
[Address]
[City, State Zip]

Dear Governor [Name]:

After almost nine months of planning and designing 14 North American colleges and universities are ready to participate in the 1999 Ethanol Vehicle Challenge. The Ethanol Vehicle Challenge is a university competition sponsored by U.S. Department of Energy, General Motors Corporation and Natural Resources Canada.

Last fall, each team received a 1999 Chevrolet Silverado full-size pickup donated by the GM Truck Group that they have optimized to run on E-85, a blend of 85 percent ethanol and 15 percent gasoline. A goal of the competition is to demonstrate that their E-85 powered trucks will perform equal to, or better than, the gasoline counterpart.

As Chair of the Governors Ethanol Coalition, a supporting organization of the Ethanol Vehicle Challenge, I would like to invite you to join me in a kick-off event at the GM Car Plant in Fairfax, Kansas, on May 17th from 2:00-3:00. Five of the fourteen schools will stopping in Kansas City on their way to the GM Proving Ground in Milford, Michigan, for five days of extensive testing on their trucks.

The five schools include [change order of importance as needed] Crowder College, University of Kansas, University of Nebraska, Idaho State University, and University of Texas at El Paso. We want to wish these teams good luck and success in the competition.

If you are able to attend or have any further questions, please contact me or a member or my staff at [phone number].

Sincerely,

William Graves
Governor

BRYAN & BRYAN INC.

International Ag-Processing Consultants

5015 Red Gulch Road
P.O. Box 159
Cotopaxi, Colorado 81223
Ph: 719-942-4353
Fx: 719-942-4358
E-Mail: etoh85@aol.com

FAX COVER SHEET

DATE: April 16, 1999

K/M
FYI
- Angela

TO: WENDY
GM Car Group communications

FAX: 248-528-4028
PH: 248-528-5347

FROM: ANGELA GRAF

PHONE: 719-942-4353
FAX: 719-942-4358

RE: EVC Send-off in Fairfax, Kansas

Number of pages including cover sheet: 4

Hello Wendy,

Here are some answers to your questions regarding the Ethanol Vehicle Challenge send-off event at the GM plant in Fairfax. Regarding the staging, a/v equipment, tent, podium, etc., Greg Krissek from the KS Dept. of Agriculture will find out more specifics tomorrow when he visits the plant. Whatever is needed, the KS Dept. of Agriculture will arrange and pay for.

Attached is a general itinerary that Greg Kissek sent me this afternoon which provides information on the tentative schedule of events, who will be invited, media arrangements, etc.

I hope this helps! Please call me if you have any questions at 719-942-4353. – Angela Graf

Q: What is needed to host a send off?
A: Space to display (4-5) GM competition trucks and an area nearby the for the Governor's press conference.

Q: Will it be indoors or outdoors? If outdoors, where and will a tent be supplied?
A: Preferably outdoors. Greg Krissek will find out tomorrow at the meeting with George Turner exactly what the plant grounds are like and whether a tent is needed. Mr. Krissek will discuss a Plan B with Mr. Turner at this time. The KS Dept. of Ag. will rent a tent and other equipment.

Q: Can plant employees attend?
A: Yes, plant employees are welcome attend. Mr. Krissek is particularly interested in having plant engineers interact with the students because they, of course, are interested in this type of career.

Q: Will this be a media event? If so, who will be invited?
A: Yes, they plan to issue a release on this event and invite Kansas City area and ag/farm media. Sue Shulte, communications coordinator for the KS Corn Growers Association will assist with a media plan. She will accompany Mr. Krissek at tomorrow's meeting and will be able to provide more details on the media during the conference call.

Q: What kind of attendance are you expecting?
A: Four schools have committed to participating so far (Univ. of Kansas, Crowder College, Univ. of Nebraska, and Idaho State University). Attendance will be team members (30-40), media (10-15), plant employees, the Governor and his staff, plus members from farm and related organizations. This is not a public gathering, so Mr. Krissek doesn't expect many members of the public to be present.

Q: Who will be paying for this?
A: KS Dept. of Ag and the Governors' Ethanol Coalition.

Q: Who are speakers in addition to Governor Graves? .....the Plant Manager?
A: Mr. Krissek would like to invite a representative from GM whether its someone from the Kansas City plant or the Truck Group. He would also like to have one or all the teams give a brief presentation. If other Governors attend, then they may speak.

Q: What do you see as GM's involvement?
A: To provide the outdoor space for a display and press conference, comply with the Governor's security, and provide a GM representative to speak.

BRYAN & BRYAN INC.

International Ag-Processing Consultants

5015 Red Gulch Road
P.O. Box 159
Cotopaxi, Colorado 81223
Ph: 719-942-4353
Fx: 719-942-4358
E-Mail: etoh85@aol.com

FAX COVER SHEET

DATE:	April 16, 1999		
TO:	**JIM SCHELL** **GM TRUCK GROUP**	**FAX:** **PH:**	248-753-7163 248-753-7161
FROM:	ANGELA GRAF	**PHONE:** **FAX:**	719-942-4353 719-942-4358

RE: Answers to your questions for the EVC Send-off in KC

Number of pages including cover sheet: 2

Hello Jim,

I spoke with Greg Krissek, Assistant Secretary of the KS Dept. of Agriculture, this morning. He provided me with answers to your questions. He will be meeting with the plant comptroller, George Turner, next Wednesday morning to further discuss the logistics and proposed event. I will be in my office today until 2:15 your time if you have any questions or would like more information. My phone is 719-942-4353.

I hope this helps!

- Angela

Q: What is needed to host a send off?
A: Space to display (4-5) trucks and a small area nearby the display for the Governor and other speakers.

Q: Will it be indoors or outdoors? If outdoors, where and will a tent be supplied?
A: It will be held outdoors. There is one door that has a slight overhang for protection from the weather, but he didn't know if it was sufficient. He'll check it out at next week's meeting. Otherwise, they (Dept. of Ag) will rent a tent.

Q: Can plant employees attend?
A: Yes, plant employees are welcome attend. Greg is particularly interested in having plant engineers interact with the students because they, of course, are interested in this type of career.

Q: Will this be a media event? If so, who will be invited?
A: Yes, they plan to issue a release on this event to Kansas City area and ag/farm media.

Q: Have you done an event at the GM plant before?
A: Governor Graves has visited the plant a twice in the past couple years. For the most part, they were tours of the plant, not press events.

Q: What kind of attendance are you expecting?
A: Four teams have committed so far (Univ. of Kansas, Crowder College, Univ. of Nebraska, and Idaho State University). So it will be team members (30-40), media (10-15), plant employees, speakers and Governor's staff. This is not a public gathering, so Greg doesn't expect many members of the public to be present. The KS Dept. of Agriculture will be inviting members of the Governors' Ethanol Coalition from the team states represented including Governors of Nebraska, Missouri and Texas (if their team participates).

Q: Who will be paying for this?
A: KS Dept. of Ag and the Governors' Ethanol Coalition.

Q: Who are speakers in addition to Governor Graves? .....the Plant Manager?
A: Greg would like to invite a representative from GM whether its someone from the Kansas City plant or the Truck Group. He would also like to have one or all the teams give a brief presentation. If other Governors attend, then they may speak.

Q: What do you see as GM's involvement?
A: To provide the outdoor space for a display and press conference, comply with the Governor's security, and provide a GM representative to speak.

Subj: **KS Send Off Event**
Date: 3/24/99
To: delarosakg, DLOOS@commerce.state.il.us

Dave and Kristen: This is what I sent off to the schools regarding the Kansas City send off event. - Angela

TO: Eli Bryan/Lori Marble Crowder College
Todd Gansauge/Steve Metzger/Jody Finnegan, Idaho State University
Kent Johnson/Mark Betty, Univ. California-Riverside
Robert Sorem/Timothy Martin, Univ. of Kansas
Ron Matthews/Jason Ku/Yigun Huang, Univ. of Texas-Austin
William Weins/Scott Peterson, Univ. of Nebraska-Lincoln
Ryan Wicker/Fernando Jasso, Univ. of Texas at El Paso

Hello EVC Teams!

The Governors' Ethanol Coalition (GEC), an EVC sponsor, is looking to have a send-off event in Kansas City, May 17 or 18, before testing begins in Milford. The GEC Chair representative, Greg Krissek, Asst. Deputy of Agriculture in Kansas, would like to host a press event in Kansas City with the Kansas Governor. He wanted me to inquire with you about the possibility of your team passing through Kansas City en route to Milford. The GEC would assist with accomodation expenses for your team.

Please contact me as soon as possible (by this email address or phone 719-942-4353) with your input on this idea, the timing of your drive to Milford and interest in participating in such an event.

I look forward to hearing from you!

Angela Graf
Bryan & Bryan Inc

Note: One of several Correspondences

Subj: **EVC in Kansas City**
Date: 3/2/99
gkrissek@kda.state.ks.us, Njmarek, delarosakg
CC: etoh85, bbikathy

Hello Greg, Dave, Norm and Kristen:

Rich Hawkins from WHB Radio (Kansas City) contacted me today regarding his interested in covering the EVC event, E85 vehicles, ethanol production and other related regional and national ethanol developments. This would include interviews with government, agriculture, GM, students, etc. The first thing that came to my mind was the proposed press event in Kansas City on Monday, May 17, with the four western schools on their way to Milford. I discussed this with Rich Hawkins and of course, he was very excited about the opportunity. His (farm) broadcast airs daily from 11:30-noon and reaches stations in Iowa, Kansas, Missouri, Nebraska and Oklahoma. If the press event is something that you are interested in pursuing, I think this will get the ball rolling. Please let me know your thoughts and I will get working on it asap. I will be out of the office, however, until Thursday.

Angela Graf

p/s Norm, could you please forward this message to Dave. I don't have his email address. Thank you!

Send-Off Event

For the
University of Waterloo

GM Canada
Oshawa, Ontario

1999 Ethanol Vehicle Challenge Send-Off
for the
University of Waterloo

Tuesday May 18, 1999
CHQ Concours Level

Agenda

9:00 AM	Vehicle set-up in Concours Level in front of Window (Qualific)
10:00 AM	Welcome (Chick McGregor)
10:05 AM	EVC Overview (Jeff Passmore – IOGEN Corp.)
10:10 AM	Ethanol Vehicle Presentation (U of W Team)
10:20 AM	GM of Canada AFV Initiatives (Neil Schilke)
10:25 AM	Q & A (Chick McGregor)
10:30 AM	Close (Students Move to Cafeteria)
10:40 AM	Vehicle moved outside to front of building (Qualific)

Canadian Renewable Fuels Association

FOR IMMEDIATE RELEASE
May 14, 1999

University of Waterloo Alternative Fuels Team Taking on U.S. Competitors in 1999 Ethanol Vehicle Challenge

GUELPH, Ontario. On May 18, the Canadian Renewable Fuels Association (CRFA) will be joining General Motors Canada as they launch the University of Waterloo's entry in the 1999 Ethanol Vehicle Challenge. The competition is a challenge to fourteen colleges and universities, in the Canada and the U.S., to convert a 1999 Chevrolet Silverado to run at peak performance on ethanol.

"The students in this competition will be the wave of the future," says Jim Johnson, President of the Canadian Renewable Fuels Association. "The vehicles go through rigorous mechanical and environmental testing to ensure that they meet and surpass vehicle and emissions standards. Their innovation will help us optimize vehicle performance and reduce environmental hazards. We wish them best of luck as they strive for excellence in this highly competitive venture."

The 1999 Ethanol Vehicle Challenge, sponsored by General Motors Corporation, Natural Resources Canada and the U.S. Department of Energy, provides an opportunity for engineering students to convert a Chevrolet Silverado pick-up truck to run on a blend of 85 percent ethanol and 15 percent gasoline. The conversion provides enormous air quality benefits by reducing hazardous smog-forming emissions and greenhouse gases.

"The team is very excited about the competition. Our hope is that it will help to demonstrate to the public that ethanol is now a viable, renewable, transportation fuel," says Nicole Dufour, Captain of the University of Waterloo Alternative Fuels Team. "Our results at last year's competition are proof of this, and we are confident that this year's results will be even better."

The University of Waterloo, sponsored by CRFA and several of its members and local suppliers, is the only Canadian team in the competition. At last year's competition, the team placed second overall and took top prize for lowest emissions. Following days of vehicle testing beginning on May 19 at the GM Proving Grounds in Milford, Michigan, the teams travel to Fort Wayne, Indiana and Peoria, Illinois before converging on Springfield, Illinois for an awards ceremony and dinner on May 26.

-30-

For further information, contact:
Dave Mather, University of Waterloo - (519) 888-4567 Extension 3885
Ellen Klupfel, CRFA - (519) 767-0431

BRYAN & BRYAN INC.

International Ag-Processing Consultants

5015 Red Gulch Road
P.O. Box 159
Cotopaxi, Colorado 81223
Ph: 719-942-4353
Fx: 719-942-4358
E-Mail: etoh85@aol.com

FAX COVER SHEET

DATE: April 25, 1999

TO: Ellen Klupfel
CRFA

FAX: 519-837-1674
PH: 519-767-0431

FROM: Angela Graf

PHONE: 719-942-4353
FAX: 719-942-4358

RE: EVC Send-off event

Number of pages including cover sheet: 5

Hello Ellen,

In follow up to our phone conversation this morning, I am faxing you a copy of a draft itinerary for the Governors' Ethanol Coalition's send-off in Kansas City and a copy of a memo with questions by GM Truck and Car Groups about the Kansas City send-off and my answers. Most of this information is only relevant if you were to pursue a send-off at the Oshawa plant, but it any case, I hope it will be useful for planning your event.

Please contact me if you have any questions about this fax or if you have any updates on developments with the send-off. I will need to inform GM and the EVC organizing group of your plans as soon as possible.

Thank you,

Angela Graf

From: Angela Graf <bbiangla@ris.net>
To: tboland@sentex.net <tboland@sentex.net>
Date: Thursday, April 15, 1999 11:50 AM
Subject: EVC Send-off for Waterloo

Terry,

I wanted to follow up with you on the send-off event for the Univ. of Waterloo. The EVC testing and road rally events are just over a month away. Having spoken to Jeff, Matt and Jim, it is apparent that there is still interest in having a send-off. Have you spoken to the Univ. of Waterloo about this?

I thought I'd forward you some questions that I gave Greg Krissek, chair rep. to the Governors' Ethanol Coalition, who is organizing a send-off at the GM plant in Kansas City. These q's may help facilitate you or whoever is taking the lead. At some point in the very near future, I will need to relay what is being planned to the EVC organizing committee and GM headquarters. Please keep me informed of any developments.

Regarding post rally activities, I am wondering if the Univ. of Waterloo would be interested in displaying their truck at the Windsor Workshop in June. Is this something you're working on already? If not, and the Univ. of Waterloo is interested and available, I can check out the possibility on displaying the truck with the conference organizers.

I look forward to hearing from you!
- Angela Graf

1. Where will the event be held?
2. When will the event be held?
3. Who will speak? (sponsors? politicians? etc.)
4. Will GM be invited to speak?
5. Will this be a media event?
6. What kind of attendance are you expecting?
7. Where do you see GM's involvement in coordinating this event?
8. Who is the point person for coordinating this event?

Ellen: per our conversation yesterday - I thought I'd send you the last email message I sent to Terry. Please call me if you have any questions.
- Angela 719-942-4353

4/21/99

Participation in Post-Competition Events

Programs from Events that included 1999 EVC

Agenda

GOVERNORS' ETHANOL COALITION MEETING

Cedar Rapids Room
Collins Plaza Hotel
Cedar Rapids, Iowa
June 22, 1999

Tuesday, June 22

7:30 - 8:00 am	**Registration and Continental Breakfast** (in meeting room)
8:00 — 8:15 am	**Opening Remarks** *Greg Krissek on behalf of Kansas Governor Graves, GEC Chairman* *Larry Bean on behalf of Iowa Governor Vilsack, GEC Vice Chairman*
	Approval of the Minutes
8:15 - 9:00 am	**National Ethanol Vehicle Coalition** - *Larry Pearce and Dave Loos*
	Update on E-85 Programs - *David Rodgers, U.S. Department of Energy*
9:00 - 11:15 am	**Committee Reports** - - Marketing Committee - *Nebraska* - Environmental Committee - *Illinois* - International Committee - *Wisconsin* - Research Committee - *Colorado* - Policy Committee — *Minnesota* - 1999 GEC Awards Competition - *Iowa* - Financial Report — *Larry Pearce*
11:15 - 11:45 am	**Ethanol Use in Bio-Remediation** - *Johanshir Golchin, Iowa Department of Natural Resources*
11:45 - 12:45 pm	**Luncheon Speaker & Informal Discussion** - *R. James Woolsey, Former Director of Central Intelligence*
12:45 - 1:15 pm	**Iowa Fuel Quality Standard** - *Lucy Norton, Iowa Corn Growers Association*
1:15 - 1:45 pm	**Ethanol Vehicle Challenge** — *Cindy McFadden, Argonne National Laboratory* *Mark Maher, GM Truck Group*
1:45 - 2:30 pm	**Northeast's Outlook on Role of Oxygenates in RFG** - *Jason Grumet, NESCAUM*

2:30 - 3:15 pm	**Outlook on the Role of Oxygenates in RFG and Ethanol Production Potential from Biomass in California** — *Pat Perez, California Energy Commission*
3:15 - 3:45 pm	**Latest on Phase II RFG** — *Debbie Wood, U.S. Environmental Protection Agency*
3:45 - 4:30 pm	**National Update** — *Doug Durante, Clean Fuels Development Coalition* *Eric Vaughn, Renewable Fuels Association*
4:30 pm	**Adjourn**
4:45 - 5:45 pm	**Special Session — "The New Petroleum"** - *R. James Woolsey, Former Director of Central Intelligence* Location: Ballroom, Collins Plaza Hotel
6:00 - 8:00 pm	**Welcoming Reception** of the Fuel Ethanol Workshop & Grand Opening of the Trade Show, *Ballroom*

Wednesday, June 23

7:00 — 8:00 a.m.	**International Committee Meeting** Iowa City Room, 2nd Floor

THE 1999 INTERNATIONAL FUEL ETHANOL WORKSHOP & TRADE SHOW

• June 22-25, 1999 •

Collins Plaza Hotel, Cedar Rapids, Iowa

Welcome! We are glad you are joining us for these important presentations and discussions that will help improve production efficiencies and reduce costs as the industry prepares for an unprecedented decade of expansion.

TUESDAY, JUNE 22

12:00 pm **Registration Opens**

1:00-4:00 pm **Tour Of Sunrise Ethanol Plant, Blairstown Iowa**

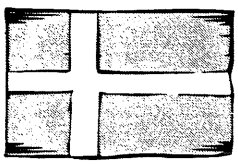
4:45-5:45 pm **SPECIAL PRESENTATION (Elm Room)**

The New Petroleum by R. James Woolsey, Former Director of Central Intelligence

A unique perspective on world energy issues that shape our future.

6:00-8:00 pm **Welcoming Reception & Grand Opening of the Trade Show**

Visit North America's top technology, service and equipment suppliers. To officially open the 15th Anniversary of the International Fuel Ethanol Workshop & Trade Show, the ribbon will be cut by Mr. Angel Marquez of Argentina, representing ethanol's expanding worldwide presence.



WEDNESDAY, JUNE 23

7:00 am **Registration Opens**

7:00 am **Continental Breakfast in the Trade Show.** Check out the details about the new Trade Show Trivia game in "The Networker." Everyone can win a 15th Anniversary FEW t-shirt!

8:00-8:30 am **Greetings from Cedar Rapids—(Elm Room) Lee Clancy, Mayor of Cedar Rapids**

Welcoming Address— The Honorable Tom Vilsack, Governor of Iowa

8:30-9:00 am **The Industry Challenge for the 21st Century; "Growth"— (Elm Room) Eric Vaughn, President & CEO, Renewable Fuels Association**

9:00-9:30 am **Ethanol: The Natural Energy Vector— (Elm Room) Bryan Cook, Director General, Energy Technology Branch, Natural Resources Canada**

9:30-9:45 am **FEW Sponsors and Industry Partners Recognition**

9:45-11:15 am **STOVER & FIELD RESIDUE COLLECTION— (Elm Room)**

Moderator: Jim Hettenhaus, c.e.a. & Mike Jawson, ARS/USDA

Harvesting: Harvesting of corn stover on a large scale was recently organized around collection points in Kearney, Nebraska; Harlan, Iowa; Sharon, Wisconsin and McLean, Illinois. The experience of contracting more than 100,000 acres with agricultural producers and using custom operators for its harvesting will be discussed.

- **David Glenn, Glenn Brothers Farms**
- **Tom Schechinger, Iron Horse Custom Farms and BioMass Agri-Products**

Soil Value: The contribution of surface stover and root residues is significantly impacted by tillage practices. Most crop residues in the northern corn belt are removed from the surface by plowing under some portion, especially in poorly drained soils.

- **Cynthia Cambardella, National Soil Tilth Laboratory,** will relate her studies including results of the relative contribution of surface stover and root systems to soil carbon.
- **Don Reicosky, USDA Ag Research Service,** will share field results disclosing the impact of tillage and residue management practice on retaining essential soil carbon.

WEDNESDAY AGENDA CONTINUES NEXT PAGE

WEDNESDAY, JUNE 23

(CONTINUED)

Sustainable Collection: With the amount of crop residues increasing as yields increase, residue management practices have become an important issue. Erosion control and long term soil quality impact are concerns as more producers move to reduced-tillage and no-tillage systems.

- **Mark Stumborg, Agriculture and Agri-Food Canada,** has led a recent study for sustainable removal of crop residues within Canada. He will describe the results and their basis. Mark will also review emerging information that provides insight into potential benefits of biomass collection and conversion within the Kyoto requirements for Canadian society.
- **Jim Schepers, USDA Ag Research Service,** is part of a group now addressing sustainable crop residue removal and potential tillage effects on soil erosion and nutrient loss. Jim's presentation includes a perspective on the current situation and the new study's primary objectives.

Commercialization Catalysts: Process economics need to be improved if the limited market for corn stover and other surface residues is to expand. Congress is working actively to accelerate these commercialization efforts with the DOE and EPA, along with industrial partners.

- **Stephanie Mercier, Minority Staff Economist, Senate Agriculture Committee,** will discuss a broad agenda to promote the production and use of biomass for non-feed, non-food uses, including ethanol.
- **Joe Michels, Scientific Advisor to Senator Richard Lugar, Chairman of the Senate Ag Committee,** addresses the proposed National Sustainable Fuels Act (S.395) designed to aggressively develop new kinetic and chemical engineering techniques for producing cost competitive fuels, chemicals and materials from biomass.

11:30-1:30 pm **Lunch in the Trade Show** with a live broadcast by Rich Balvanz on WMT radio.

1:30 pm **Break-Out Sessions**

• RECOVERY OF FIBER IN THE CORN DRY-GRIND ETHANOL PROCESS: A FEEDSTOCK FOR VALUABLE COPRODUCTS (Cedar Rapids Room)

New value-added opportunity for dry mills—the recovery of corn fiber from the mash from which valuable corn fiber oil and resulting cholesterol-lowering compounds can be extracted. This recovery process can reduce the net corn price, increase the fermentable substrate and increase the processing capacity of the plant.

Vijay Singh, University of Illinois and Eastern Regional Research Center/ARS/USDA

• WATER CONSERVATION AND WASTEWATER REDUCTION IN FUEL ETHANOL PLANTS: THE PATH TO ZERO DISCHARGE

Water conservation in modern fuel ethanol plants continues to progress beyond wastewater treatment, while water re-use and wastewater reduction techniques move plants toward true "Zero Discharge". Industry members will describe some of the techniques and technologies in use and under development, designed to meet that goal.

Moderator: Joe Ruocco, Phoenix Bio-Systems

- **Mark Blunier representing Williams Ethanol Services, Inc.**
- **Richard Hanson representing Agri-Energy, LLC**
- **Adrian Galvez representing Chippewa Valley Ethanol Company**
- **David Culver representing Ethanol 2000, LLP**

• DEVELOPING OPPORTUNITIES FOR DISTILLERS GRAINS (Elm Room)

Explore new dimensions in cutting edge research and expanding market opportunities for DDGS.

Moderator: Kelly Davis, Chippewa Valley Ethanol Company

- The latest developments in research—**Charlie Staff, Distillers Grains Technology Council**
- Update on the hog feeding trials underway—**Scott Johnson, Al-Corn Clean Fuels**
- DDG Trends & Characteristics...A Merchandiser's Viewpoint—**Richard Carlson, Archer Daniels Midland**

3:15 pm **Break-Out Sessions**

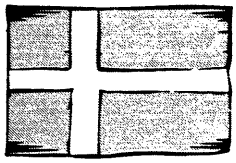
•THE IMPORTANCE OF YEAST NUTRITION IN THE ALCOHOL FERMENTATION (Rosewood Room)

The ingredients of mash and the composition of yeast foods that are used all influence the rate of fermentation, the completeness of the fermentation and therefore the yield of alcohol, which is made. Fermentation rate is related to the amount of yeast biomass.

Mike Ingledew, University of Saskatchewan

WEDNESDAY AGENDA CONTINUES NEXT PAGE

WEDNESDAY, JUNE 23 (CONTINUED)



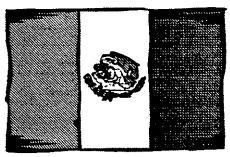
•MODIFYING YOUR FUEL ETHANOL PLANT TO PRODUCE BEVERAGE AND INDUSTRIAL SPIRITS (Elm Room)
An opportunity to examine methods and modifications that may allow your facility to produce a greater variety of ethanol products and improve your bottom-line.
John Murtagh, Murtagh & Associates

•THE RESULTS OF THE ETHANOL VEHICLE CHALLENGE (EVC) (Cedar Rapids Room)
Hear about the exciting results of the 1999 Ethanol Vehicle Challenge, a highly successful competition between 14 U.S. & . Canadian universities and colleges. Technological innovations from optimizing Chevrolet Silverado 4x4 pickup trucks to run on E85 are receiving widespread attention. A 1999 Silverado and a GM E85 Sonoma truck are on display in front of the hotel.
Moderator: Angela Graf, Bryan & Bryan Inc. (BBI)
- **•Cindy McFadden, Argonne National Laboratory**
- **•Mark Maher, General Motors Truck Group**
- **•Michael Svestka, University of Illinois at Chicago, the First Place Team**
- **•Jim Redding, Williams Ethanol Services, Inc.**

4:15-6:00 pm **Refreshments in the Trade Show**
After an intense day of sessions, enjoy some light refreshments while visiting with industry suppliers.

6:30 pm **Old-Time Picnic in the Park— *15TH ANNIVERSARY CELEBRATION***
Entertainment, Friendly Competition, Grilled Iowa Pork Chops and More. Monies collected from a fun and good-natured dunk tank event will be used to establish a FEW College Scholarship Fund and will be matched by BBI. Busses will run continually

THURSDAY, JUNE 24



7:00am **Registration Opens**
7:00-8:00 am **Continental Breakfast in the Trade Show**
8:00-8:30 am **General Session**
KEYNOTE SPEAKER- A Global Perspective — Marty Andreas, Senior Vice President & Assistant to the Chief Executive, Archer Daniels Midland Company (Elm Room)

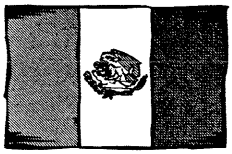
8:30-10:00 am **NOW THAT WE HAVE THE STOVER & RESIDUES, ARE WE READY TO MAKE ETHANOL? (Elm Room)**
Three years ago at the FEW in St. Paul, process technology companies apprised us on the status of their cellulosic conversion technologies. Now we invite those companies and several new guests to update us on advancements.
Moderator: David Glassner, National Renewable Energy Laboratory
- **•Joe Glas, BC International**
- **•Pat Foody, IOGEN Corporation**
- **•Mark Fatigati, Arkenol, Inc.**
- **•Rolf Berg, Swedish Ethanol Development Foundation**
- **•Robert Walker, SWAN Biomass**

10:00-11:00 am **Refreshments in the Trade Show—** Last chance to view the exhibits. Best Booth Award and exhibitor drawings.
11:00-12:30 pm **Break-Out Sessions**

• CELLULOSE PRETREATMENT (Cedar Rapids Room)
A great deal of discussion has revolved around the need to pretreat cellulosic feedstocks. This session will address developments in the practices and economics of cellulose pretreatments.
Michael Ladisch, Purdue University LORRE

• PROCESS OPTIMIZATION: "DON'T LET BAD THINGS HAPPEN TO GOOD DATA" (Elm Room)
Looking for a way to turn those mountains of data into a competitive advantage? Learn an effective technique to help you evaluate "what-if" and "trade-off" scenarios for process optimization, raw material substitution and new product development.
Tim Swanson, Starch Conversion Technology

THURSDAY AGENDA CONTINUES NEXT PAGE



THURSDAY, JUNE 24

(CONTINUED)

• A "ONCE IN A THOUSAND YEARS" SESSION — Y2K (Chestnut Room)
With the advent of the Year 2000, it is important that all precautions are taken to assure that ethanol plants don't experience interruptions. This discussion will address steps to take inside the plant. Also, are your suppliers of public utilities, transportation sector, and government agencies prepared?

Moderator: Mark Luitjens, Heartland Grain Fuels
• Y2K "The Big Picture"— Jim Donley, Federal Emergency Management Agency (FEMA)
• Y2K and the Plant— Tom Teijido, Williams Ethanol Services, Inc

12:30 pm **Box Lunch (Notice to Golfers: Your box lunches will be in your carts at the course.)**

Afternoon: Time for In-Depth Discussions and Optional Activities
12:45-6:00 pm GOLF TOURNAMENT AT HUNTERS RIDGE
1:30-6:00 pm TOUR OF THE AMANA COLONIES
1:30-4:30 pm VOLLEYBALL GAME

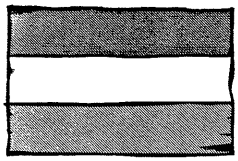
Evening: Dinner On Your Own

Plan now to attend!

2000 International Fuel Ethanol Workshop & Trade Show

Cleary Convention Centre
Windsor, Ontario
June 20-23, 2000

(Visit the Windsor Hospitality Booth in the Atrium of the Collins Plaza)



FRIDAY, JUNE 25

7:00 am **Breakfast (Elm Room)**
Special Address— Mr. Wu, General Manager, Hei Longjiang China Resource Golden Corn Co., Ltd.
Mr. Wu's company is the largest alcohol producer in Asia and Europe.

8:00 am **THE ETHANOL INDUSTRY IN NIGERIA (Elm Room)**
Mr. Olaoluwa Toyin Bamikole, Nigerian Yeast and Alcohol Manufacturing Company (NIYAMCO)

8:15 am **BENCHMARKING...THE ROAD TO INDUSTRY STANDARDIZATION**
As a result of the final roundtable discussion at 1998 FEW, we will discuss some of the methods and approaches our industry can take to improve, benchmark and standardize procedures.
Moderator: Lucy Norton, Iowa Corn Growers Association
- Fifteen Years of Progress—**Mike Bryan, Bryan & Bryan Inc.**
- Designing and building the plant to Chemical Process Industry Standards (CPI)—**Matt Janes, Commercial Alcohols**
- Learning from the Oil Refining & Petrochemical Cluster Concept— **Alain Lefebvre, Natural Resources Quebec**
- The Need for Benchmarking—**Mike Graboski, Colorado School of Mines**

9:45 am **2ND ANNUAL FORUM OF FUTURISTIC THINKERS (Elm Room)**
Back by popular demand. The audience is invited to participate in a lively and insightful discussion with a roundtable of industry leaders about technological and marketplace requirements necessary to maintain a vital industry.
Discussion Leader: Jack Huggins, Vice President Ethanol Operations, Williams Ethanol Services, Inc.

11:15 am **Workshop Adjourns**

11:30 am **TOUR OF ARCHER DANIELS MIDLAND(ADM) Cedar Rapids, Iowa**

6:30 pm **Informal Group Event**
As always there will be an informal get-together. A sound from the past, "The Guess Who," will be playing at Cedar Rapid's annual "America Fest". Details in the Workshop Notebook.

SESSION 8: CLIMATE CHANGE AND TRANSPORTATION – PANEL DISCUSSION
Moderator: Bernie James, TransEnerTech

Panelists:
Mark Nantais, CVMA
Matthew Bol, Sypher Mueller
Mark Saberman, University of Toronto
Ken Mitchell, Shell Canada
Rep from alternative fuels industry

1730 **SESSION CLOSES**

1830-2000 **RECEPTION** ***Horizons – CN Tower***

1800 Buses begin loading at the front entrance of the hotel for a one way trip to the CN Tower on Front Street. Enjoy cocktails, canapés and best views of the city in Horizons Café at the top of Toronto. Experience the spectacular view and the 360 degree outdoor terrace.
You may return to the hotel by using the TTC Yonge Subway line exiting at the Yonge and Bloor station, using the direct underground entrance to the Radisson Hotel.

Wednesday, June 9, 1999

0700 **REGISTRATION OPENS**
Foyer - Forest Hill Ballroom

0700 Continental Breakfast
Foyer - High Park Room

SESSION 9: PARTICULATE EMISSIONS – INVESTIGATION, MEASUREMENT AND CONTROL
Chair: Lionel King, Environment Canada

0830-0900 **Particulate Matter and Precursor Emissions from Two Light Duty Gasoline Vehicles**
Lisa Graham, Environment Canada

0900-0930 **Diesel Particulate Filters – Experience and Future Directions**
Don Wilford, Engine Control Systems

0930-1000 **Real-time LAMS (Laser Ablation Mass Spectrometry) The Future of Aerosol Analysis**
G.J. Evans, R.E. Jarvis, P.V. Tan and E. Kremer, Dept. of Chemical Engineering and Applied Chemistry, University of Toronto

1000-1030 **BREAK** ***Foyer - High Park Room***

SESSION 10: HEAVY DUTY VEHICLE EMISSIONS ISSUES IN CALIFORNIA
Chair: Mike Jackson, ARCADIS, Geraghty & Miller

1030-1100 **Overview of Heavy-duty Engine/Vehicle Technologies Meeting California's Air Quality Requirements**
Mike Jackson, ARCADIS, Geraghty & Miller

1100-1130 **Regulatory Approach to Controlling Diesel Particulate Matter**
Bill Lovelace, Regulatory Strategies, California Air Resources Board

1130-1200 **Implementing the Moyer Incentive Program at the Local Level**
Tim Taylor, Mobile Source Division, Sacramento Metro Air Quality Management District

1200-1215 Wrap-up - Bernie James

1215 **WORKSHOP CLOSES**

SOCIAL PROGRAM

Two events are planned for 1999.

Reception
Monday, June 7, 1999
1730 - 1900
High Park Room and Outdoor Terrace

At the conclusion of Monday's technical sessions, there will be an informal cocktail reception at the Radisson Plaza Hotel.

Reception
Tuesday, June 8, 1999
1830 - 2000
Horizons - CN Tower

At the conclusion of the session on June 8, workshop participants will be bused (one-way) to the CN Tower in the heart of Toronto's entertainment district adjacent to SkyDome, within walking distance of numerous restaurants, theatres and the Toronto waterfront. Enjoy cocktails, canapés and the best view of this city to be found anywhere. You may return to the hotel by using the TTC Yonge Subway line exiting at the Yonge and Bloor station, using the direct underground entrance to the Radisson Hotel.

PROGRAM

1999 WINDSOR WORKSHOP on Transportation Fuels

Sponsored By:
Natural Resources Canada
U.S. Department of Energy

Radisson Plaza Hotel (Bloor & Yonge)
Toronto, Ontario, Canada
June 7 – 9, 1999

Presented By:
Bodycote ORTECH Inc.

1000-1030 **BREAK** ***Foyer - High Park Room***

SESSION 2: MEDIUM DUTY POWERPLANTS
Chair: Ron Graves, Oak Ridge National Laboratory

1030-1100 **Performance of a Flex-fuel DI Caterpillar 3126 on Gasoline and Alcohol Fuel**
J. Rey Agama, Caterpillar, Inc.

1100-1130 **Chassis Dynamometer Emissions Comparison of Medium Duty Buses on Natural Gas**
Nigel N. Clark, Mridul Gautam, Donald W. Lyons, West Virginia University

1130-1200 **Market Introduction of Urban Transport Solutions Based on New Propulsion Systems**
David Moon, AEA Technology Environment, UK.

1200-1330 **LUNCH** ***High Park Room***

SESSION 3: HYBRID AND ELECTRIC VEHICLES ***Forest Hill Ballroom***
Chair: Stephanie Lines, NRCan, CANMET Energy Technology Centre

1330-1400 **The Toyota Prius**
David Hermance, Powertrain, Toyota Technical Center, USA

1400-1430 **Ford's P-2000 Fuel Cell Vehicle**
Bradford Bates, Alternative Power Source, Ford Research Lab.

1430-1500 **Hybrid Off-road Vehicle Design and Evaluation**
Richard Hellinga, Vehicle Group, Agile Systems Inc.

1500-1530 **Advances in the Lithium Polymer Battery**
Martin Simoneau, Hydro-Quebec

1530 **BREAK** ***Foyer - High Park Room***

SESSION 4: TESTING TECHNOLOGY AND LIMITATIONS
Chair: John Storey, Oak Ridge National Laboratory

1600-1630 **Rapid, In Situ Characterization of Diesel Particulates**
Arlon Hunt, Lawrence Berkeley Lab.

1630-1700 **Low Level Particulate Emissions from Vehicles**
Richard E. Chase and Matti M. Maricq, Ford Research Lab.

1700-1730 **Chemical Characterization of Combustion of Individual Particulates in Real Time**
Peter T.A. Reilly and William Whitten, Oak Ridge National Laboratory

1730 **SESSION CLOSES**

1730-1900 **RECEPTION** at the Radisson Plaza Hotel ***Foyer - High Park Room***

Tuesday, June 8, 1999

0700 **REGISTRATION OPENS** ***Foyer - Forest Hill Ballroom***

0700 Continental Breakfast ***Foyer - High Park Room***

SESSION 5: NEW SPECIFICATION FUELS
Chair: Steve Goguen, US DOE

0800-0830 **Heavy Duty Fuels Activities at the US Department of Energy**
Steve Goguen, US DOE Office of Heavy Vehicle Technology

0830-0900 **Automotive Fuels Activities at the US Department of Energy**
John Garbak, US DOE Office of Advanced Automotive Technologies

0900-0930 **DMM-Diesel Blended Fuels for Compression Ignition Engines**
Keith Vertin, National Renewable Energy Laboratory

0930-1000 **Fuels for Fuel Cells**
Pat Davis, US DOE Office of Advanced Automotive Technologies
Bob Sutton, Argonne National Lab.
Nick Vanderborgh, National Renewable Energy Laboratory

1000-1030 **BREAK** ***Foyer - High Park Room***

SESSION 6: NATURAL GAS TECHNOLOGY: SMALL SCALE LIQUEFACTION, NGV STORAGE AND CNG INFRASTRUCTURE
Chair: Alissa Oppenheimer, Gas Research Institute

1030-1100 **Status of DOE's Single Stage, Mixed Refrigerant, LNG Liquefier Project**
Kenneth J. Kountz, Institute of Gas Technology

1100-1130 **Developments in Reducing Cost and Enhancing Durability of NGV Fuel Containers**
Denny R. Stephens, Battelle Memorial Institute

1130-1200 **Increasing CNG Fuel Station Utilization through FuelNet**
Robert R. Adams, Marathon Compressor Co. Ltd.

1200-1400 **LUNCH**
Special Guest Speaker ***High Park Room***

SESSION 7: FIELD TRIALS/DEMONSTRATION OF ATF VEHICLES
Chair: Tom Smyth, NRCan, CANMET Energy Technology Centre

1400-1430 **Clean Air Trucks**
Hugh Canning, Fiba Canning Inc.

1430-1500 **Neural Control Systems for Alternative Fuel Vehicles**
Adrian Ghelesel, BC Gas Utility Ltd.
Mike Sulatisky, Saskatchewan Research Council

1500-1530 **Operational Experience of Fuel Cell Buses**
R.D. Merritt, dbb Fuel Cell Engines Inc.

1530-1600 **BREAK** ***Foyer - High Park Room***

Program continues on back

Canadian
Renewable Fuels
Association

Canadian Renewable Fuels Association

1999 Annual Meeting and Convention

AGENDA

Wednesday, June 9, 1999
Radisson Plaza Hotel Toronto
90 Bloor St. East, Toronto, Ontario

10:00 a.m. – 12:00 p.m. **CRFA Director's Meeting**

12:30 p.m. – 1:30 p.m. **Luncheon**

1:30 p.m. – 2:00 p.m. **Welcome and Opening Remarks**
Jim Johnson, President, CRFA

2:00 p.m. – 2:15 p.m. **Update on CRFA Public Awareness Program**
Ellen Klupfel, Public Information Coordinator, CRFA

2:15 p.m. – 2:30 p.m. **Update on Ethanol Vehicle Challenge**
Jeff Passmore, Executive Vice President, IOGEN Corporation

2:30 p.m. – 3:00 p.m. **Keynote Presentation - Canada's Climate Change Program: Transportation and Where It's Going**
Rodney Semotiuk, Transportation Energy Analyst, Natural Resources Canada

3:00 p.m. – 4:00 p.m. **CRFA Annual Members Business Meeting**

4:00 p.m. – 4:30 p.m. **CRFA New Directors Meeting**

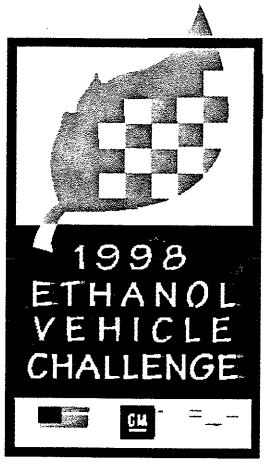
Articles Submitted by Teams from 1998 EVC

COLLEGE OF ENGINEERING

WAYNE STATE UNIVERSITY'S E-85 Ethanol Vehicle

1998 Ethanol Vehicle Challenge

First Place Winner!

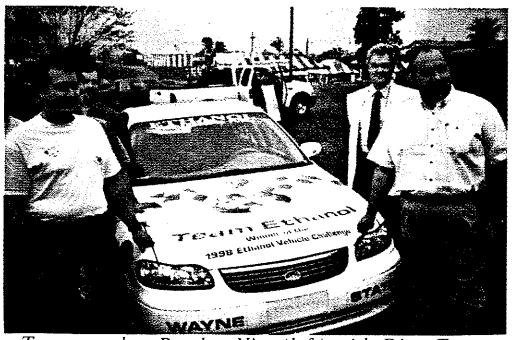


Wayne State University's ethanol vehicle earned its top position among the nation's ethanol cars by outperforming all competitors in a field of 14 colleges and universities at the 1998 Ethanol Vehicle Challenge June 2, 1998.

Over a period of nine months, Team Ethanol WSU re-engineered a stock 1997 Chevy Malibu. Making several key modifications, the 10 students and their faculty advisor proved that performance and fuel economy do not have to be sacrificed to produce a clean burning automobile. In fact, the Wayne State ethanol car achieved 20 percent better energy baseline fuel economy than its gasoline-powered counterpart.

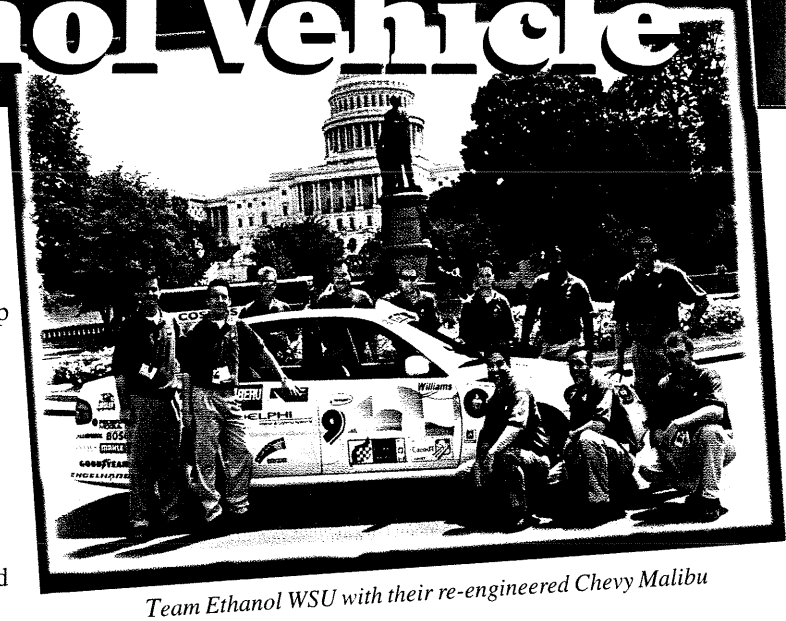
The achievement by the Wayne State student team demonstrates that it is not unreasonable to expect future generations of ethanol cars to achieve far greater fuel economy. Ethanol vehicles or ethanol hybrids may be extremely attractive solutions to environmental issues facing automakers and the driving public.

Dubbed "the nation's number one ethanol car," the Wayne State ethanol car drew the broader attention it deserves when, on July 7, 1998, the governor of Michigan, John Engler, rode in it from the Governor's Mansion to the Michigan Agriculture Expo at Michigan State University. The car will be shown at the Michigan State Fair in August and at the International Auto Show January 1999.



Team member Bogdan Nitu (left) with Dinu Taraza, faculty advisor, and Gov. John Engler.

Team Ethanol WSU applied fairly simple modifications to their GM donated Malibu that can be implemented without major retooling or changes in the manufacturing process. The team introduced a series of intermediate coil heaters to the intake manifold to heat the air for cold starting. And they redesigned the pistons to take advantage of ethanol's superior compression ratio. In addition, the materials in the entire fuel system were replaced with stainless steel and nylon to prevent corrosion.



Team Ethanol WSU with their re-engineered Chevy Malibu

Modifications for success...

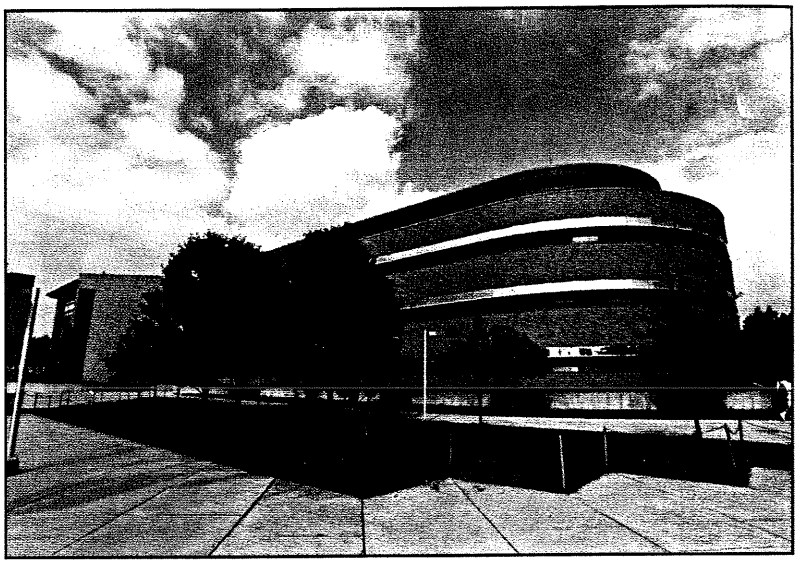
PISTONS *Reshaped tops of pistons to:*
- increase compression ratio from 9.5 to 12.5
- optimize architecture of combustion chamber

INTAKE MANIFOLD *Introduced custom intermediate coil heaters to:*
- preheat air for better cold starting

factoid #1: *Ethanol is a renewable fuel derived from corn or other crops. Since it contains oxygen, it contributes to a cleaner, more efficient burn than gasoline. E-85, a common blend of 85 percent ethanol and gasoline used by the Wayne State car, reduces CO emissions by approximately 25 percent. Ethanol also helps to reduce ozone-forming emission, particulates and nitrogen oxide.*

factoid #2: *There are more ethanol vehicles on the road today than you think. Look at your car manual. You may even be the owner of a ethanol flexible vehicle without knowing it. Many new Chrysler minivans and Ford Tauruses and Rangers are capable of running on E-85!*

WSU College of Engineering



With about 1,400 undergraduates and 1,200 graduate students, the Wayne State College of Engineering has three important missions: teaching, research and outreach. It serves the region, state and nation as a part of an urban comprehensive research university. Students prepare for professional practice, graduate study, and lifelong learning and leadership positions.

The Engineering Campus consists of four separate facilities: 1) the main engineering building with administrative offices and laboratory wing 2) the new Manufacturing Engineering building with advanced facilities for factory floor operations 3) the Bioengineering building and 4) the Division of Engineering Technology.

Research at the College of Engineering is focused on strategic research thrusts, on interdisciplinary teamwork and partnership with industry. The research thrusts include: automotive engineering, environmental/ infrastructures engineering, manufacturing / materials engineering, information/ communication engineering, and bioengineering.

> Students have the opportunity to participate in national competitions such as the ethanol car, a hybrid/electric vehicle, a Mini-Baja, and a human powered vehicle.

The Wayne State Mechanical Engineering Department, where many of the student projects are born, is closely allied with Detroit industry. Researchers work on the cutting edge of technology to develop the future car. But its mainstay, automotive engineering, is only one specialty.

Students in Mechanical, Civil and Electrical Engineering have the opportunity to participate in national student competitions on projects such as the ethanol car, a hybrid (gas/electric) vehicle, a Mini-Baja, a human powered vehicle, a concrete canoe and autonomous vehicle.

Undaunted, Wayne State's HPV entry

Student Projects

In 1995, the Wayne State Hybrid Electric Car performed extremely well at the Chrysler Challenge in Auburn Hills led by team captain Otto Wilhelm, Jr., graduate student Scott Berman and Jerome Meisel, professor of Electrical and Computer Engineering. The team earned third overall with its modified 1992 Ford Escort. More importantly, the car's uniquely designed controller helped it place first in acceleration in electric/gas mode, in emissions, and in all-around efficiency.

That was the last year for the competition. But the Wayne State Hybrid Car enjoyed the limelight in 1996 when Sen. Carl Levin visited the College of Engineering to drive the car. The car now rests inside the high bay area of the new Manufacturing Engineering building side by side with other recent student projects, including the Ethanol Car and the Human Powered Vehicle (HPV).

The success of the Wayne State Hybrid Car also served as inspiration for other student teams. In the fall of 1995, a team of mechanical engineering students advised by Associate Professor Chin-An Tan, began developing plans for the school's first competitive HPV, *Just In Time*, so named for last-minute preparations on the fiberglass shell. The team placed 14 out of a field of 28 at the 1996 American Society of Mechanical Engineers' Human Powered Vehicle Competition in Reno, Nev. The following year, the team traveled to San Diego, Calif. with their redesigned front wheel drive vehicle, *Undaunted*. The team placed 10th this time out of 28 schools.

In 1997 and 1998, Wayne State fielded a Mini-Baja car for the Society of Automotive Engineers' Midwest Mini-Baja Design Competition. Finally, the Engineering Technology Division has been developing an autonomous vehicle capable of maneuvering through an obstacle course on its own using an advanced visual system and computer technology.

For more information about Wayne State's student engineering projects, call 313 577-6531. E-mail: dreich@dbo.eng.wayne.edu
Or visit us on the net at http://www.eng.wayne.edu

OTIS' WEATHER FORECAST

Partly sunny, with mild breezes and a chance of sprinkles.

High 63/Low 44

THE SOUTH END

The Official Student Newspaper of Wayne State University

Monday, June 8, 1998

Volume 35, Issue 7

Bulworth worth the hype.

Page 4.

WSU's Team Ethanol triumphs; Nationals are next

BY CRAIG WEHLER
The South End

Wayne State University's Team Ethanol was on fire, literally, in the 1998 Ethanol Vehicle Challenge.

The team overcame a small engine fire prior to the competition, but still managed to take their 1997 Chevy Malibu for a drive down victory lane.

WSU's Team Ethanol competed against 13 other top engineering schools across the country en route to driving away in triumph, winning the 1998 Ethanol Vehicle Challenge.

"We had a very solid design, but it was hard to judge a placement," said John Auld, a graduating senior in mechanical engineering and Team Ethanol member. "I knew we'd be competitive."

Each team was given a 1997 Chevrolet Malibu and challenged to modify it so it would run on E85 fuel, which is 85 percent ethanol and 15 percent gasoline. According to Auld, ethanol is a renewable fuel source which comes from corn crops and is clean burning.

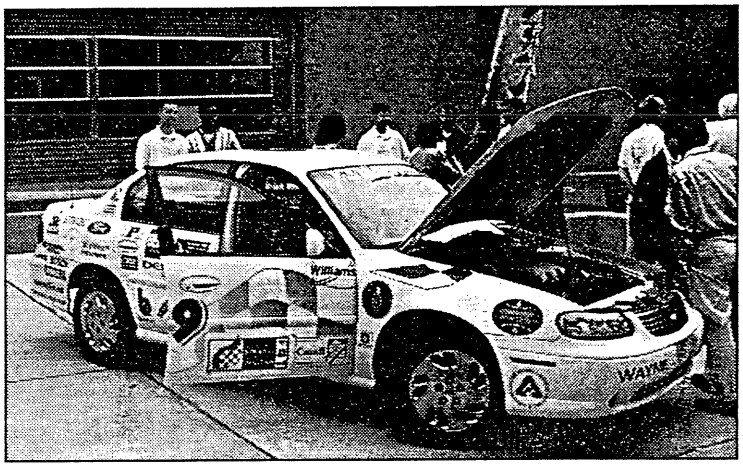
The use of ethanol as a fuel source would reduce greenhouse gases in the atmosphere, as well as reducing the country's dependence on imported oil, according to Auld.

"This (corn crop) is something that could be kept in America," he said.

The eight-day event — which began May 25 — was held at the General Motors Proving Grounds in Milford, Mich., where teams were judged on acceleration, fuel economy, emissions, driving through a track, a design report, and an oil presentation. The event was sponsored by the U.S. Department of Energy, the General Motors Corp., and Natural Resources Canada.

"General Motors is keenly interested in the continued development of alternatively fueled vehicles," according to Dennis Minano, GM's vice president of public policy and their chief environmental officer. "The Ethanol Vehicle Challenge not only provides an opportunity to work with many motivated students, but also contributes significantly to a better understanding of the use of

Please See **Ethanol** Page 3



Craig Wehler/The South End

■ **WSU's Team Ethanol overcame an engine fire prior to racing, but they still managed to drive their 1997 Chevrolet Malibu down victory lane in the 1998 Ethanol Vehicle Challenge at the GM Proving Grounds.**

New law dean brings deja vu to WSU

BY BECKY STEMPNIK
The South End

Joan Mahoney has a lot in common with the man she's replacing as dean of the Wayne State University Law School.

Mahoney, currently a professor of law and former dean at Western New England College School of Law, was recently named dean of the WSU Law School by President Irvin Reid.

She is also a WSU alumna, and said she is delighted to be coming back.

"It's a school that served me well when I was in Law School," she said, so when she heard about the deanship position opening, she said she was "very excited about the opportunity" to return to the University.

Mahoney assumes the deanship Aug. 1, succeeding current dean James Robinson, who has been nominated by President Bill Clinton's administration to be the next assistant attorney general in charge of the Criminal Division in the U.S. Department of Justice.

Both Robinson and Mahoney graduated magna cum laude with juris doctor degrees from WSU's School of Law. And while attending the school, both worked on the Wayne Law Review.

At one point, Robinson could have been Mahoney's instructor for an evidence course, but she decided not to take the class because it was offered at night, she said. However, a few years later, after she graduated, Mahoney went to work at Honigman Miller Schwartz & Cohn, a law firm at which Robinson was a partner.

They worked together for several years, according to Robinson, and back then, he said he knew her as "an energetic and talented lawyer."

"She was (also) an outstanding student at the Law School," Robinson said. "It was quite interesting that she pursued this position.

"I feel good about the fact that she was selected as dean."

John Petersen, dean of the Col-

Please See **Mahoney** Page 7

'You can do it,' says astronaut alum

BY RANDY SHY
Contributing Writer

Astronaut Jerry Linenger told the 1998 Wayne State University School of Medicine graduates to reach for the stars Thursday before a packed auditorium at the Detroit Opera House.

Linenger, a Medical School alumnus, delivered the commencement address at the 121st WSU School of Medicine commencement ceremony, and also received an honorary Doctor of Humane Letters degree from WSU President Irvin Reid.

Linenger said it was great to be back on the planet, celebrating the accomplishments of the graduates of the School of Medicine.

"(You) are happy and busting at the seams with pride," he said. "I was one of you, and it's great to be one of you again joining in this great celebration."

Linenger, an Eastpointe native, also shared stories with graduates and their families about his decision to become an astronaut.

"Dad, I want to be an astronaut," he recalled telling his father at age 13. "He said, 'Son, you can do it.'

"It takes one person to tell you you can do it, and it makes all the difference in the world."

Medical School grads can reach their goals the same way, according to Linenger. Set a goal, he said, and take small steps to reach that goal.

"We are here to celebrate our goals," he said. "When I look at problems on the planet, I always try to take one step back and try to understand the problem. If I don't have a perspective yet, I step back one step further and try to look at the big picture."

Linenger urged the graduates to also step back and "look at the big picture" when they confront problems in life.

Please See **Linenger** Page 7

Paul Gallagher/The South End

■ **WSU President Irvin Reid prepares to turn the mic over to astronaut Jerry Linenger at the School of Medicine's commencement ceremonies Thursday.**

TARTAR SAUCE "So, how about those Red Wings?"

BY BECKY STEMPNIK

BEFORE GAME 6:

"I think they're gonna win, as long as Chris Osgood doesn't let any goals in from the center ice area."

Rob Gordon, graduate student studying history.

"I think they'll go all the way. I think Osgood's gonna step up."

Dan Gallina, first-year law student.

"I think they'll win, but they were better with Vladdie."

Jeff Gerak, second-year pharmacy major.

AFTER GAME 6:

"Usually, they do everything right, but even when they don't, they still win. They're gonna lose a few games here and there, but they're gonna win (the Stanley Cup.)"

Alex Michelotti, senior Italian, Spanish and French major.

"I think they're the best team out there. I think Chris Osgood is underrated. People shouldn't get on his back all the time."

Kevin Williams, junior, sociology.

"They're the best. We know they're gonna do it again this year."

Carmen Smith, post-graduate student working for a graduate certificate in infant mental health.

Ethanol

From Page 1

ethanol as a fuel."

"I'm just glad we could get such good results for the school," Auld said.

WSU's "good results" included first place finishes in fuel economy and acceleration. The WSU vehicle attained 29.2 miles per gallon for highway driving, and a top speed of 81 mph from a dead start in just more than 16 seconds. Those numbers outperformed a stock gas-powered car — plus cleaner emissions — according to Auld, who was in charge of emissions.

"We were right there in every event," team member Christopher Day said.

After taking the checkered flag on May 29, it was off to the nation's capital. While in Washington, the team found out they had finished in first place, and went on to participate in the National Clean Cities parade, displaying a Red Wings sticker on the back bumper of their Malibu.

In addition to the parade, the ethanol cars belonging to all the participating teams were displayed on Capitol Hill, Auld said. "We met some very high profile people."

The College of Engineering then celebrated the return of the team Friday, June 5 with a short celebration and display of the car in the College of Engineering's courtyard.

"We are very proud of the team. This reflects the quality of our undergraduate program," said College of Engineering Dean Chin Kuo.

"Everyone came together, which is a good example of the college," he said. "We are No. 1."

The team also received congratulations from their faculty advisor, Professor Dinu Taraza, who said: "This team put a lot of heart and work into the project, and they deserve this result."

Families and fans also deserve appreciation, according to team members.

Team member Jeff Wuttke said thanks need to go out to the parents of team members for supporting the late nights team members put into the effort. "You barely know your family after a while," he said, "(but) you make some great friends."

Team spirit was also a major factor, according to Jeff Jarvis, another team member. Seeing everyone wearing the same shirts and clapping for one another the last day of the competition meant a lot. "That's what it is all about," he said.

Many team members expressed that students need to get involved in something like the Ethanol Challenge.

"Every undergraduate needs an experience like this event," Jarvis said.

"I hope more students will get involved in the event," Auld said. "It is a lot of extra work, but in the end, seeing your own work perform pays off."

WSU's Team Ethanol includes John Auld, 25; Christopher Day, 29; Greg Goleski, 22; Jeff Jarvis, 21; Clifford Lyons, 29; Anthony Morelli, 21; Paul Nahra, 22; Bogdan Nitu, 33; John Shinska, 23; Jeff Wuttke, 23; and Faculty Advisor, Professor Dinu Taraza.

WSU team wins ethanol car competition

Wayne State University is planning to move into NCAA Division One sports competition, but it is already in Division One of automotive engineering research.

A team of engineering students at Wayne State built an ethanol-powered car that beat teams from 13 other top engineering schools to win the 1998 Ethanol Vehicle Challenge, sponsored by the U.S. Department of Energy, General Motors and Natural Resources Canada.

The WSU team, with a strong Grosse Pointe component, modified a 1997 Chevrolet Malibu to operate on E85 fuel (85 percent ethanol, 15 percent gasoline). The WSU vehicle topped the other entries in an eight-day event at the General Motors Proving Grounds in Milford.

The team's faculty adviser is Dinu Taraza, of Grosse Pointe, and one of the students on the team is John Auld, of Grosse Pointe Farms.

"Something will come of this competition," said Auld, reflecting the motivation and enthusiasm of the students for the project. "It could be a student who comes up with a simple solution to the problem they're looking for. Our ideas are there. Our approach is there."

The new president of Wayne State University, Irvin Reid, was impressed with the vehicle and excited by the victory. (Reid drove the car before the competition.) "I share the campus communityís sense of pride in the achievement of our students and faculty," Reid said.

The task for each team in the Ethanol Challenge was to modify a 1997 Chevy Malibu to operate on this alternative fuel. Ethanol, which is an alcohol made from corn or other grain, could contribute to significantly reducing exhaust emissions by automobiles into the atmosphere. As a renewable resource, it could also reduce the nation's dependence on imported oil. This is why the federal government, the Canadian government and General Motors are interested in ethanol.

The downside — and the challenge for the student teams — is that ethanol has a lower power density than gasoline and is more corrosive to materials. So the team had to figure how to maximize performance and find materials that could stand up to ethanol.

The students did well enough to win, although minutes before the competition began, a small engine fire cast an ominous shadow on the venture.

The fire broke out after a team member started the engine just before opening ceremonies. Team members went to work to figure out what had happened. They reinsulated and rerouted a wire connecting the coil heater. Apparently, the wire short-circuited after the insulation degraded as it rested against an engine component which heated during use.

The Wayne State vehicle, which attained 29.2 miles per gallon on the highway and a top speed of 81 miles per hour from a standing start in about 16 seconds, demonstrated that a stock gasoline-powered car can be modified to operate on ethanol without sacrificing performance or fuel economy.

Automobiles are capable now of running on gasoline with ethanol mixed in, usually 10 percent, without problems in performance or economy.

The Wayne State design can be implemented in the manufacturing process fairly simply, said David Reich, spokesman for the College of Engineering.

The team spent nine months in the school's automotive testing labs developing special streamlined pistons to take better advantage of ethanol's capability for high-compression ratio. Team members attributed their car's first-place performance in acceleration and fuel economy to this modification.

Several other significant modifications were made, including introduction of a special coil heater attached to the engine manifold to improve cold starts.

GM and most other auto makers are keenly interested in alternative fuels, engines and power trains. At the North American International Auto Show in January at Cobo Center, GM Chairman Jack Smith said no car company will survive in the 21st century if it relies solely on the gasoline combustion engine.

One of the most surprising aspects of this year's show was the focus on alternative powertrains — electrics, electric hybrids and fuel cells.

In the past, these displays of advanced alternatives to the conventional gasoline internal combustion engine have appeared to reflect public relations more than serious intent to manufacture and market. But this January, it seemed different.

The very top auto company officials were there in person to tell the message — that clean, reliable energy sources will indeed be incorporated in automobiles. Not in some vague distant future, but in the next few years. And in a limited way, now.

GM Chairman Smith and a team of top executives outlined the corporation's EV1 program, which calls for a progression of improved electric vehicles with a fuel-cell-powered unit in production by 2004. First generation EV1s are now on sale in California.

Alex Trotman, Ford Motor Co. chairman, has announced a $400 million joint venture with Daimler-Benz for development of a fuel-cell vehicle. He said Ford plans to have a zero-emission fuel-cell vehicle ready by 2004.

Chrysler plans to introduce the EPIC Electric Minivan, targeted initially for fleets in California, this model year. EPIC is an acronym for "Electric Powered Interurban Commuter."

Just about all of Europe's car manufacturers are interested in fuel cells. The most prominent example of Europe's push toward fuel cells is Daimler-Benz and Ford with Ballard Power Systems. Daimler-Benz AG became in May the first major carmaker to unveil a fuel cell-powered passenger car.

Another is that Italy's Ansaldo Ricerche, of Genoa, is developing a 35-40 kW fuel cell for a hybrid engine for a mid-sized car project with Peugeot-Citroen. Siemens is reportedly gearing up to work on fuel cells with BMW and possibly Volkswagen and Opel, GM's German division.

In Paris, Peugeot-Citroen has joined with government transportation and power company experts to set up an infrastructure for charging of experimental small electric vehicles built by Peugeot-Citroen and leased to members of the public.

In Japan, Toyota is marketing an electric version of its four-door RAV4 sports-utility vehicle to fleet users. The RAV4-EVs will be among the first mass-produced vehicles to use advanced nickel-metal hydride batteries.

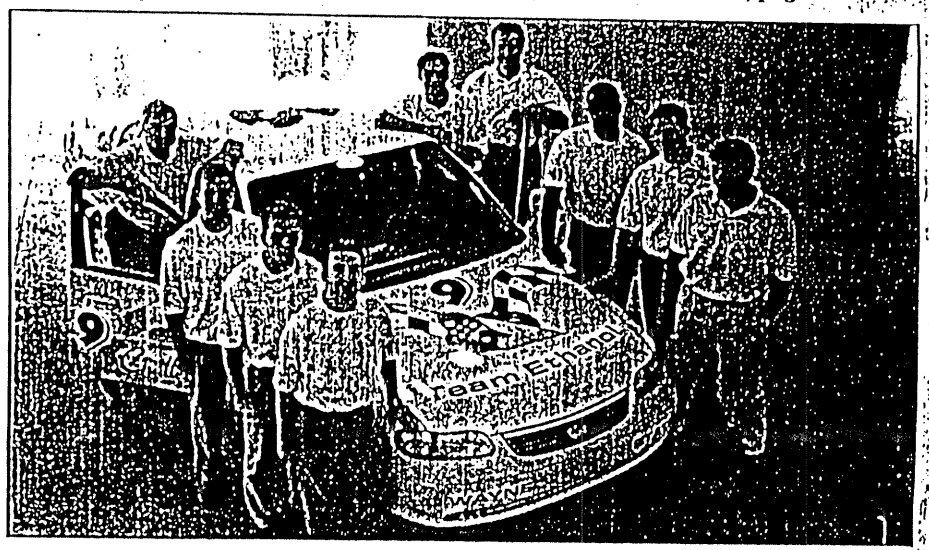
Toyota is also developing a high-efficiency hybrid powertrain which comprises a gasoline engine and an electric motor in a four-door sedan it calls the Prius.

The Honda EV PLUS is an all-new, four-passenger electric car, the first EV on the market in the United States to use advanced nickel-metal hydride batteries. It is being leased to fleets and retail con-

See AUTOS, page 13A

Autos

By Richard Wright



Photos by Mary Jane Murawka

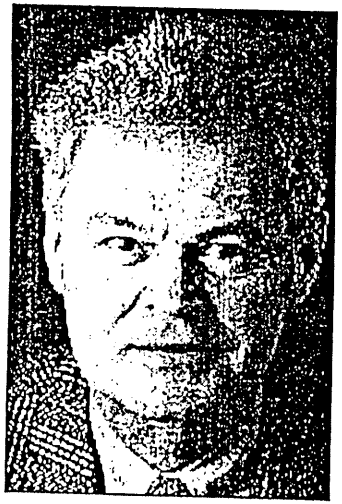
Wayne State University College of Engineering's Team Ethanol with winning Malibu.

Autos

From page 11A

sumers in California.

Nissan is marketing the Altra EV, the first electric vehicle available in the United States powered by lithium-ion batteries. The Altra EV is powered by a 62 kW, 13,000 rpm, 83-horsepower synchronous motor utilizing a new odymium-iron-boron internal high performance magnet. Nissan plans to place a limited number of Altra EVs with fleet users in California.



Faculty adviser for WSU's Team Ethanol is Dinu Taraza, professor of mechanical engineering, of Grosse Pointe.

The industry is working toward a fuel cell, an electrochemical device that combines hydrogen and oxygen to produce electricity with zero emissions, low noise and high energy efficiency. This would be a major milestone toward high-mileage, non-polluting electric vehicles.

But for the immediate future, the hybrid electric is here now, already being built. The hybrid uses a conventional engine to charge batteries to run an electric powertrain. An engine running at steady speed would produce fewer emissions and get better economy. Here, low-polluting ethanol is a possible alternative to gasoline or diesel fuel — and an even stronger possibility after the recent competition.

The winning WSU team includes John Auld, of Grosse Pointe Farms; Christopher Day, of Livonia; Greg Goleski, of Clinton Township; Jeff Jarvis, of Warren; Clifford Lyons, of Detroit; Antony Morelli, of Fraser; Paul Nahra, of Macomb Township; Bogdan Nitu, of Detroit; John Shinska, of Columbus, Ohio; Jeff Wuttke, of Sterling Heights, and Dinu Taraza, of Grosse Pointe, professor of mechanical engineering and faculty adviser.

"The Ethanol Challenge not only provides an opportunity to work with many motivated students, but also contributes significantly to a better understanding of the use of ethanol as a fuel," said Dennis R. Minano, GM vice president of public policy and chief environmental officer.

Auto checkup helps ease summer driving worries

A quick and easy automotive checkup can help prepare a vehicle for the stress of summer's high temperatures and increase reliability on long road trips, according to AAA Michigan.

"The cold temperatures may be behind us, but summer heat can be just as hard on automobiles as the fiercest winter weather," says Robert Kaczor, automotive services director at AAA Michigan.

"A few minutes spent checking your car's vital components can help you enjoy a summer of trouble-free driving," Kaczor noted.

To help prevent dangerous and inconvenient tire failure, examine tires for uneven or excessive tread wear. Make sure all tires, including the spare, are inflated properly.

With the engine off, look for worn or cracked belts and damaged, blistered or soft hoses.

If driving under extreme conditions — such as very hot temperatures or towing a heavy trailer — switch to a motor oil with higher viscosity. Check the owner's manual for specific oil recommendations.

If you are not comfortable performing this inspection yourself, a qualified auto service facility can conduct a thorough examination.

ASEC is a Medal Winner Again !

by Doug Linden

The University of Illinois at Chicago and the University of Texas at Austin tied for first place in emission control using ASEC catalysts. The team of engineering graduate students at the University of Illinois at Chicago recently placed third overall in the 1998 Ethanol Vehicle Challenge using ASEC technology.

The challenge involved fourteen schools with ASEC supplying the catalysts to three of the entrants. Each school's engineering team was judged in ten areas of competition.

1 Written design report
2 Oral design presentation
3 Vehicle design inspection
4 Emissions
5 On-road fuel economy
6 EPA fuel economy
7 Cold start
8 Solo handling
9 Acceleration, and
10 Driveability

Before the competition, each vehicle had to pass a safety inspection, and there were penalty points deducted for exceeding a noise threshold.

Each team started with a 1997 Chevy Malibu with a 3.1 liter, V-6 engine donated by General Motors. The cars were then "re-engineered" to the guidelines of the challenge. The tests were conducted at General Motors' Milford, Michigan, Proving Grounds over seven days.

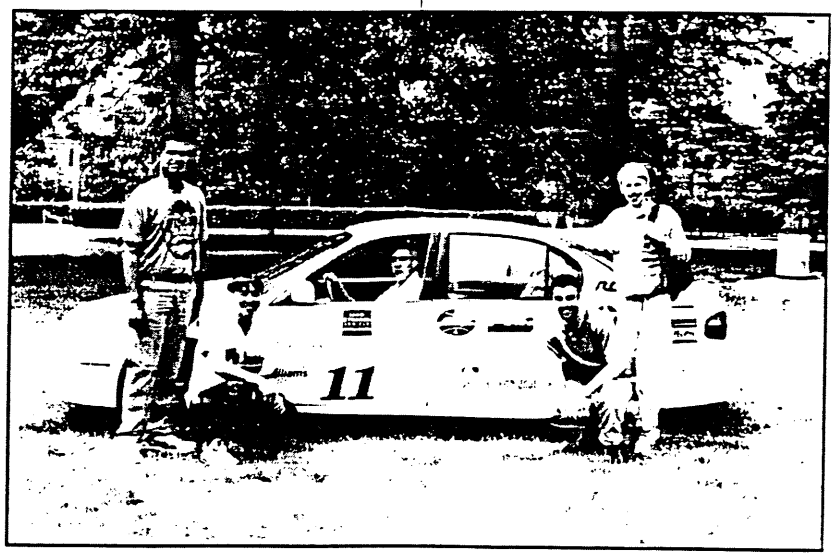
The ASEC catalysts were prepared in the Catoosa Pilot Plant, and put into converters in the Delphi-Flint Model Shop.

In addition to the University of Illinois at Chicago, ASEC/ Delphi also supplied converters to the University of Texas at Austin, and the University of Texas at El Paso, who finished eighth and tenth overall.

The University of Illinois at Chicago also took the top individual award in Best Cold Start Performance.

ASEC has been providing technical support to university challenges using alternative-fueled vehicles for several years, and will provide catalysts for the 1999 Ethanol Vehicle Challenge, which is already sponsored by General Motors.

I'll give you the good news next year, too! ◆



Pictured left to right: Raoul Castro, Kwan Choi, Mike Svestka, Guiseppe Sammartino, and Dr. Brianno Collar proudly display their winning entry.

Contact: Denise Yockey
Marketing & Communications Div., 517-373-1104
Contact: Robert Craig
Office of Agriculture Development , 517-241-2178
June 12, 1998

Michigan Department of Agriculture Director Congratulates Wayne State University, Kettering Institute Students as Winners of Ethanol Vehicle Challenge

Michigan Department of Agriculture (MDA) Director Dan Wyant today congratulated the Wayne State University and Kettering Institute teams of automotive engineering students who won the 1998 Ethanol Vehicle Challenge (EVC), a national competition that concluded earlier this week. The Wayne State University team took first place overall.

"I applaud the ingenuity and dedication of these bright college students who won several awards in the competition," Wyant said. "We share the belief that ethanol-powered vehicles are good news for the environment and agriculture, and reduce our dependence on imported energy.

"Furthermore, the Ethanol Vehicle Challenge demonstrates that these cars can fulfill the needs of the motoring public," Wyant said.

The challenge for each team was to reconfigure a 1997 Chevrolet Malibu to operate on an E85 fuel (85 percent ethanol, 15 percent gasoline). Student teams from 14 colleges and universities in the U.S. and Canada have worked since last September to design, retrofit and evaluate the ethanol-powered vehicle. The cars were evaluated for improved fuel economy, low exhaust emissions, cold start performance and good driving performance as compared with a traditional gas-powered vehicle.

The highlight of the months-long project was a competition, presentation and motorcade that began May 26 at the General Motors Proving Grounds in Milford and traveled to Washington, D.C. The awards ceremony was held on Capitol

Hill on June 2.

In addition to its 1st Place Overall Award, the Wayne State University vehicle was honored for Best Acceleration and Best Fuel Economy. The Kettering Institute vehicle was honored for Best Engine-Out Emissions.

Michigan has been a leader in testing and using alternative fuels and alternative-fueled vehicles (AFVs), according to Wyant. The State of Michigan vehicle fleet is currently 20 percent AFVs, exceeding the federal requirement for them. It includes 10 ethanol-powered vehicles and the state has announced plans to purchase 50 more ethanol-fueled vehicles this year.

Schools competing in the Ethanol Vehicle Competition were: Cedarville College, Ohio; Crowder College, Missouri; Kettering Institute, Michigan; Idaho State University, Iowa; Illinois Institute of Technology, Illinois; Mankato State University, Minnesota; University of California, Riverside; University of Illinois, Chicago; University of Kansas, Kansas; University of Nebraska, Lincoln; University of Texas, Austin; University of Texas, El Paso; University of Waterloo, Ontario, Canada; and, Wayne State University, Michigan.

The 1998 Ethanol Vehicle Challenge was sponsored by General Motors Corporation, U.S. Department of Energy, Natural Resources Canada, the Council of Great Lakes Governors, and many other entities dedicated to improving the performance of alternative-fueled vehicles

| Back |

SAE places 3rd in 1998 Ethanol Vehicle Challenge

[illegible]

[illegible] (from left), [illegible], Faculty Advisor [illegible] (ME), Mike Svestka and [illegible] pose with [illegible] car prior to the SAE competition.

The rewards of giving back

Why are these folks smiling? Because they know they have made a difference in their fellow students' lives. Every semester, outstanding upperclassmen volunteer many hours from their busy schedules to help incoming students become familiar in their new environment. As unpaid teaching assistants (TAs) in the Engineering Orientation Course, these students help freshmen and transfer students get to know each other in small groups. As successful upperclassmen in their majors, the TAs serve as role models as they share their survival tips.

The college is very grateful for the time and effort these students contribute to making the engineering environment more friendly.

TAs from last fall:

[illegible]	[illegible]
Simon Belano (ME)	Mike Lubin (ME)
[illegible]	[illegible]
KI Chan (EE)	Ronald Mansur (EE)
[illegible]	[illegible]
Andy Chow (EE)	Rich Nagle (ME)
[illegible]	[illegible]
Miguel Dowgopowiak (EE)	Pooja Pathak (ChE)
[illegible]	[illegible]
James Flavin (EE)	Edwin Quinto (EE)
[illegible]	[illegible]
Mario Gasgonia (Comp. Eng.)	Rubenllexo Remigio (Ind. Eng.)
[illegible]	[illegible]
Erich Gierhart (EE)	Ron Rudniski (EE)
[illegible]	[illegible]
Kathleen Harkabus (ChE)	Salman Sharief (Comp. Eng.)
[illegible]	[illegible]
Purvi Joshi (ChE)	Steve Stasinos (EE)
[illegible]	[illegible]
Mike Kuczynski (CME)	Asif Tayeb (Comp. Eng.)
[illegible]	[illegible]
Kensen Lam (BioE)	

essn

Opening Ceremony

Milford Proving Ground ▫ Military Facility

May 20, 1999 ▫ 1:30 PM

Ian McEwan,
Master of Ceremonies
Director of Engineering, Quality and Product Assurance,
GM Proving Ground

Richard Moorer
Associate Deputy Assistant Secretary for Transportation Technologies,
U.S. Department of Energy

Tom Stephens
GM Vice President and Group Director, Truck Group

GENERAL MOTORS MEDIA ADVISORY

WHO:

Key participants include:
Ed Koerner, executive director of Powertrains, Chassis and HVAC systems for the GM Truck Group, students from fourteen of the top U.S. and Canadian engineering schools including team from Kettering University in Flint and Wayne State University in Detroit participating in the 1999 Ethanol Vehicle Challenge and fourteen modified 1999 Chevy Silverado pickups.

WHAT:

1999 Ethanol Vehicle Challenge Opening Ceremonies and Drive Opportunities

- Remarks from GM and U.S. Dept. of Energy executives
- Vehicle walkarounds/photo opportunities (cameras allowed)
- Talk with GM executives and engineers about ethanol and other alternative fuels
- Talk with students participating in the competition
- Drive ethanol & gas powered trucks

WHEN:

Thursday, May 20, 1999
12 – 3 p.m. (lunch will be provided)

WHERE:

General Motors Milford Proving Ground
Milford, Michigan

OVERVIEW:

In the fall of 1998, General Motors donated fourteen 1999 Chevy Silverado full-size pickups to fourteen top U.S. and Canadian engineering schools participating in the 1999 Ethanol Vehicle Challenge. Ethanol (or E85), a blend of 85 percent denatured ethanol and 15 percent gasoline, plays an important role in GM's commitment to the advancement of alternative fuel and vehicle technologies.

The Ethanol Vehicle Challenge, sponsored by the U.S. Dept. of Energy (DOE), Natural Resources Canada (NRCAN), and General Motors, gives students real-world engineering experiences as they convert gas powered pickups to ethanol power.

The opening ceremonies begin several days of exhausting judging and testing of the fourteen vehicle entries. The winning team will be announced during an awards ceremony on Wednesday, May 26 at the Illinois State Fairgrounds.

Directions to GM Milford Proving Ground

To Milford from Flint

- South on U.S. 23
- East on M-59 to Hickory Ridge Road
- South on Hickory Ridge Road to GM Road
- East (right) on GM Road (Milford Proving Ground entrance)
- Proceed to Lundstrom House (parking, registration and transportation to event sight)

To Milford from Detroit

- I-96 West to Milford Road
- North on Milford Road to GM Road
- West (left) on GM Road (Milford Proving Ground entrance)
- Proceed to Lundstrom House (parking, registration and transportation to event sight)

To Milford from Ann Arbor

- North on U.S. 23 to I-96
- I-96 East to Milford Road
- North on Milford Road to GM Road
- West (left) on GM Road (Milford Proving Ground entrance)
- Proceed to Lundstrom House (parking, registration and transportation to event sight)

Ethanol Vehicle Challenge
Opening Ceremony/Media Event
May 20, 1999

By 12:00 Media arrive at Lundstrom House

- Park and check in at Lundstrom House
- Transportation to Military Area (MF)

12:30-1:30 Lunch

- Buffet lunch
- Meet speakers
- See and photograph vehicle display

1:30-2:00 Opening Ceremony

Speakers:

- Ian McEwan, Director of Engineering, Quality, and Product Assurance, GM Proving Ground
- Richard Moorer, Associate Deputy Assistant Secretary for Transportation Technologies, U.S. Dept. of Energy
- Tom Stephens, GM Vice President, Group Director of Engineering, GM Truck Group

2:00-3:00 Continuation of viewing and interviewing*

- Interview students (MF)
- Drive trucks (MF)

* Transportation intervals needed to take media back to entrance

Ethanol Vehicle Challenge
Opening Ceremony/Media Event
May 20, 1999

Journalists Confirmed

- Don Schroeder, Car & Driver *
- Brian Corbett, Wards
- Lindsey Brook, Automotive Industries
- Barry Kluzcyk, (Freelance writer) Truckin', Super Chevy, Sport Truck, Chevy Truck *
- Dick Noble, Flint Journal
- Kevin Carpenter, TV 12 Flint (ABC affiliate)
- Katherine Zachary, Oakland Tech News
- Eddie Alterman, Automobile Magazine

Journalists Tentative

- Jack Keebler, Motor Trend *
- Mel Serrow, TV 5 Flint
- Dave Sedgwick, Automotive News
- Don Gonyea, NPR (Detroit)

Journalists or Outlets Contacted (Waiting Reply)

Road & Track
CNN
Local T.V. (2, 4, 7, 50)
Paul W. Smith, WJR radio
Steve King & Johnnie Putnam, WGN radio

* ***Requested E85 vehicle for post-EVC evaluation.***