

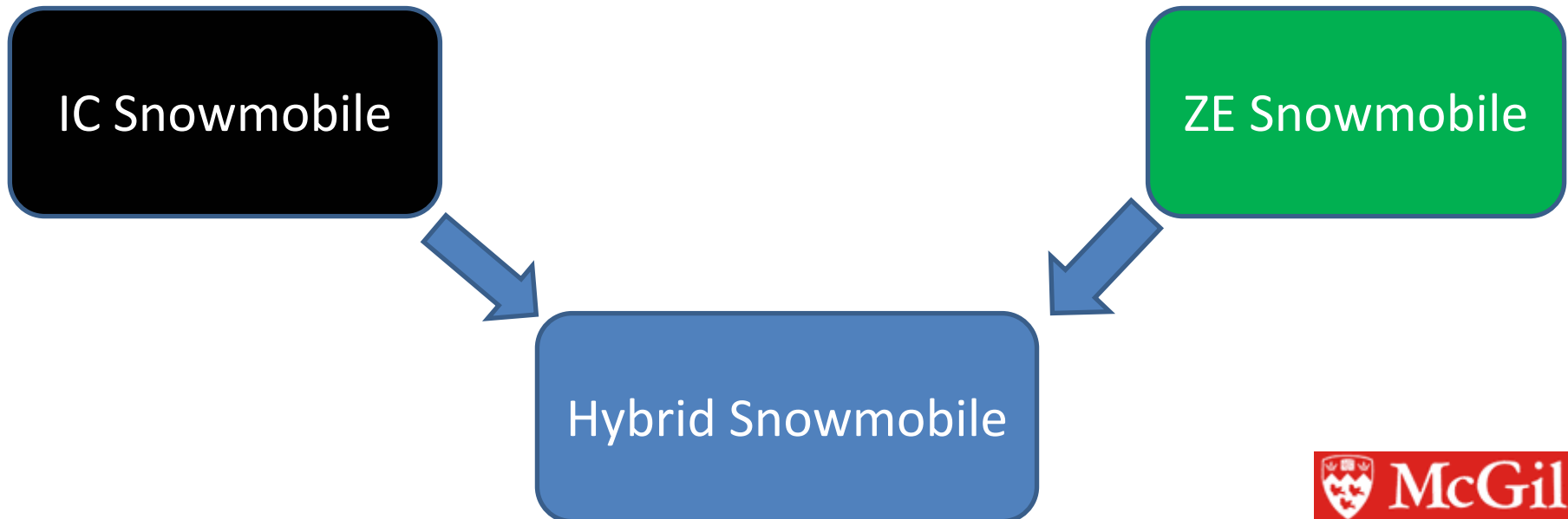
Hybrid Snowmobile Prototype 2008

Presentation by Albert Mathews

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SNOWMOBILE OPERATOR PERSPECTIVE

- Appeal of Hybrid Vehicles in the Automotive Market
- Standard Snowmobile Ergonomics





AD Boivin Fuel

ECTech

McGill Faculty of Engineering

CVTech inc

HIPERTECH

Di-count

VERT Profect

Camoplast

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ARISTO

ALTAIR

SNOWMOBILE DEALER/OUTFITTER PERSPECTIVE

- Improve Green Image of Snowmobile Touring Companies
 - Removable, Reliable, Lost Cost Power Pack
- Possibility for User Selection Between Hybrid and Electric Modes
 - Improved Handling



ENVIRONMENTAL PERSPECTIVE

Noise

Emissions

Fuel Economy

Noise

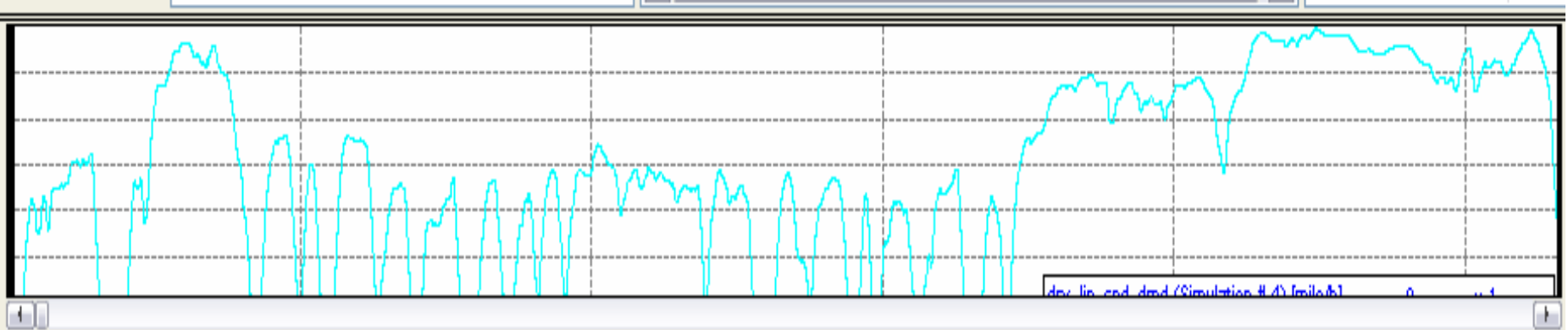
TEAM	J192 Level
#1 University of Wisconsin-Madison	73
#2 University of Minnesota-Duluth	74
#3 Kettering Univ	73
#5 University of Maine	67
#6 Michigan Tech Univ	DNF
#7 University of Wisconsin-Platteville	DNF
#8 SUNY-Buffalo	61
#10 University of Idaho	73
#11 Minnesota State University - Mankato	78
#18 McGill Univ (Exhibition only)	64

Emissions

Emission

	CO	UHC	NOx	UHC+NOx	Number	E>100	POINTS	Ordinal	Fuel
#1University of Wisconsin-Madison	1.5	0.1	36.4	36.5	185.3	185.3	237	5	E85
#2University of Minnesota-Duluth	207.4	3.5	0.3	3.9	155.6	155.6	100	7	E85
#3Kettering Univ	77.6	0.9	0.1	1.0	189.9	189.9	253	4	E85
#5University of Maine	67.9	0.9	3.3	4.3	190.2	190.2	253	3	E10
#6Michigan Tech Univ	64.7	2.5	0.4	2.9	191.9	191.9	259	2	E85
#7University of Wisconsin-Platteville							0	8	E85
#8SUNY-Buffalo	0.2	0.0	5.4	5.4	206.3	206.3	300	1	B10
#10University of Idaho	68.2	17.9	5.6	23.5	177.3	177.3	207	6	E10
#11Minnesota State University - Mankato							0	8	E85
#18McGill Univ (Exhibition only)							0		E10

Fuel Economy



Assumptions **Main Results** Full Results Data & Graphics Energy Balance GREET

Description	Unit	Simulation # 1 (Load)	Simulation # 2 (Load)	Simulation # 3 (Load)	Simulation # 4 (Load)
Results Interval	s	0 - 2137	0 - 2137	0 - 2137	0 - 2137
Cycle distance	mile	17.61	17.67	17.67	17.67

THERMAL INFORMATION

Engine					
Fuel economy	mile/gallon	28.72	33.01	31.2	34.5
Fuel economy gasoline equivalent	mile/gallon	25.82	29.68	28.05	31.02

Energy loss accmech	Wh	16931.1	12550.28	13590.4	12831.92
Energy loss eng	Wh		186.93	207.53	232.47

Conclusion

- Hybrid Snowmobiles could benefit the Snowmobile touring industry from both user and Tour Operator points of view
- Available data suggests that Hybrid Snowmobiles could provide a touring snowmobile solution that minimizes the environmental and social concerns directed at the sport

Questions?

