Greening Up Your Fleet

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Co-Founder &

Sustainability Engineer

www.greencarco.com

The Green Car Company

We sell Alternative Fuel and High Efficiency Vehicles

- In business for 2 years
- Consumer Sales and Service Department
- Focused on Consumer Education

2007 – Fleet Division

- Offer new and used eco-friendly vehicles as well as fleet consultations to municipal, business and educational fleets
- Provide in depth analysis of new vehicles, and modification kits as they become available
- Justify our expert recommendations with credible environmental impact reports

The Green Fleet Program

Environmental Impact Analysis Tool

- Vehicle to Vehicle Comparisons
  - Replacing or Deciding between options
- Fleet Evaluation and Alteration
  - Establishing a Baseline
- Dynamic Analysis

Developed by the Green Car Company

Powered by Argonne National Lab's - GREET model

GREET - Greenhouse Gas Regulated Emissions and Energy Use in Transportation

- Complete Lifecycle Analysis
  - Producing the fuel
  - Refining the fuel
  - Distributing the fuel
  - Burning the Fuel
  - Manufacturing and Recycling the Vehicle
  - Manufacturing and Recycling the Batteries
  - Maintenance and Operation impact

GREET Quantitative Data

- Quantity of CO2 emissions produced per gallon of biodiesel, gasoline, diesel, etc burned
- Quantity of Sulfur Dioxide emissions produced per lb of Li-Ion, Ni-Mh or PbA batteries produced/recycled
- Quantity of Fossil Fuel consumed per lb of vehicle manufactured

20-mile PHEV Input Variables

Vehicle Group Statistics		
Number of Vehicles	1	#
Avg. Liquid Fuel Economy	40	Miles/Gallon
Avg. Electric Fuel Economy	4	Miles/Kwh
Avg. Nat. Gas Fuel Economy	0	Miles/SCF
Avg. Miles Traveled	15000	miles/vehicle/year
Avg. Vehicle Weight	2890	lbs
Avg. Purchase Cost	$36,500	$/vehicle
Avg. Vehicle Life	12	Years
Replaced Vehicle Sales Price	$0	$/vehicle
End of Life Sales Price	$2,000	$/Vehicle
Avg. Maintenance Cost	$600	$/vehicle/year
Battery Type	Li-Ion	Chemistry
Avg. Battery Life	6	Years
Avg. Battery Replacement Cost	$5,000	$/bat. pack/vehicle
Avg. Battery Weight	160	lbs
Battery Sell Back	$0	$/bat. pack/vehicle

Fuel Blender	% Fossil Fuel	39.9%	
% of Blend	65%	35%	0%
Fuel Code	7	1	0
0	Renewable	Gasoline	0

Diesel Dodge Sprinter Lifecycle Impact Report

Energy Impact	Eq. Gal/Veh/Life	Eq. Gal/Group/Life	MPG Equivilant	Driving	Manufacturing	Batteries
Fossil Fuel	15,269	15,269	16.5	93.3%	6.7%	0.0%
Petroleum	13,237	13,237	19.0	98.5%	1.5%	0.0%
Petroleum/Nat Gas	14,454	14,454	17.4	95.7%	4.3%	0.0%

Group				% Impact per phase		
Environmental Impact (Grams/Vehicle/Year)		Environmental Impact (Grams/Vehicle/Life)		Driving	Manufacturing	Batteries
CO2	8,859,591.96	CO2	148,841,144.98	93.2%	6.8%	0.0%
CH4	10,187.71	CH4	171,153.48	89.7%	10.3%	0.0%
N2O	38.83	N2O	652.41	81.7%	18.3%	0.0%
GHG's (Tons)	**9.11**	**GHG's (Tons)**	**152.97**	**93.1%**	**6.9%**	**0.0%**
VOC: Total	2,737.41	VOC: Total	45,988.44	27.3%	72.7%	0.0%
CO: Total	5,012.39	CO: Total	84,208.15	31.0%	69.0%	0.0%
NOx: Total	4,871.17	NOx: Total	81,835.65	81.8%	18.2%	0.0%
PM10: Total	1,905.21	PM10: Total	32,007.49	44.1%	55.9%	0.0%
PM2.5: Total	695.72	PM2.5: Total	11,688.14	47.9%	52.1%	0.0%
SOx: Total	4,079.68	SOx: Total	68,538.67	57.9%	42.1%	0.0%
VOC: Urban	1,392.08	VOC: Urban	23,387.01	21.9%	78.1%	0.0%
CO: Urban	606.00	CO: Urban	10,180.81	95.9%	4.1%	0.0%
NOx: Urban	1,047.82	NOx: Urban	17,603.33	91.2%	8.8%	0.0%
PM10: Urban	188.35	PM10: Urban	3,164.21	90.6%	9.4%	0.0%
PM2.5: Urban	108.90	PM2.5: Urban	1,829.45	90.6%	9.4%	0.0%
SOx: Urban	1,060.55	SOx: Urban	17,817.25	85.2%	14.8%	0.0%

Short Term Costs	Cost per Year	$/Mile
Fuel Cost	$1,977	$0.13
Maintenance	$500	$0.03
Batt. Replacement	$0	$0.00
Total Cost	$2,477	$0.17

Lifecycle Costs	Per Vehicle
Net Purchase Cost	$32,850
Fuel Cost	$33,218
Maintenance	$8,400
Total Cost	$74,468

B85 Golf replacing Toyota Prius Lifecycle Comparison (16.8 years)

Fossil Fuel Depletion	Biodiesel Golf (B85)	Toyota Prius	Eq.GalGas of	
Effective Mile Per Gallon	**59**	**35**	**Fossil Fuel**	
Fossil Fuel Consumed	4283.50	7219.72	Eq.GalGas/Life	
Petroleum Consumed	1737.51	5847.30	Eq.GalGas/Life	
Petrol & Nat. Gas	3660.40	6622.74	Eq.GalGas/Life	

Environmental Impacts	Biodiesel Golf (B85)	Toyota Prius	Difference	% Reduction
CO2	36,934,980.29	69,417,243.79	-32,482,263.50	46.8%
CH4	65,719.03	84,889.36	-19,170.33	22.6%
N2O	3,296.69	1,010.88	2,285.80	-226.1%
GHG's (Tons)	**39.42**	**71.67**	**-32.25**	**45.0%**
VOC: Urban	19,621.33	28,823.22	-9,201.89	31.9%
CO: Urban	3,619.51	16,157.97	-12,538.46	77.6%
NOx: Urban	5,649.86	9,491.33	-3,841.47	40.5%
PM10: Urban	757.39	1,722.34	-964.95	56.0%
PM2.5: Urban	445.13	999.31	-554.19	55.5%
SOx: Urban	5,849.08	8,265.07	-2,415.99	29.2%

Total Cost Differences	Biodiesel Golf (B85)	Toyota Prius	Difference	
Net Purchase Cost	$17,000	$21,275.00	-$4,275	
Fuel Cost	$19,389	$19,040.00	$349	
Maintenance	$8,400	$8,400.00	$0	
Net Bat. Replacement	$0	$0.00	$0	
Sales Price	-$2,000	-$2,000.00	$0	
Total Cost Difference	**$42,789**	**$48,715.00**	**-$5,926**	

THE green car COMPANY

Consultation

- Using Alternative Fuel Blends
- Vehicle Trip Reduction
- Matching Vehicles to Use

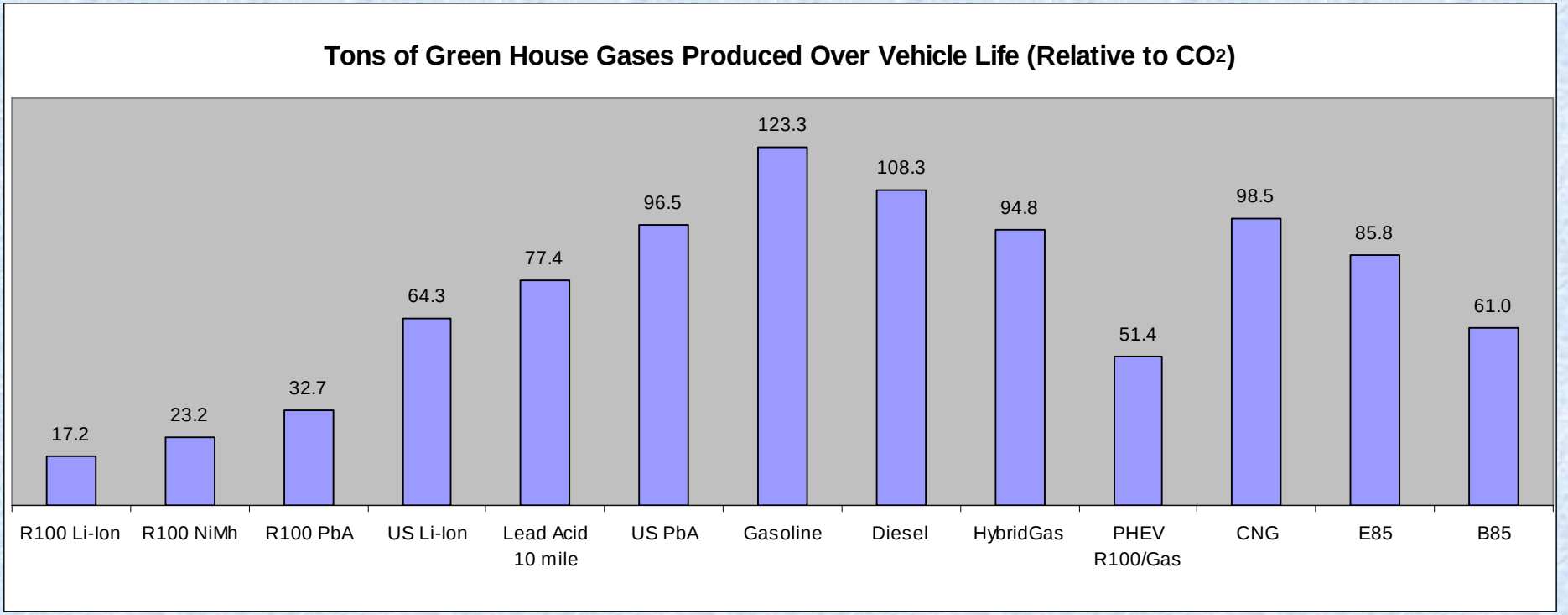
Products & Support

- Green Vehicles
- Installation
- Repair
- Training

Email: **greg@greencarco.com** for private consultation

www.greencarco.com

Modeling a Ford Ranger



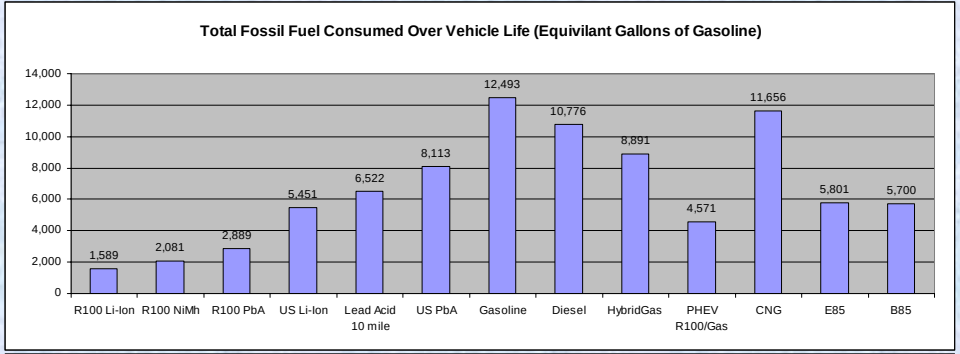
R100 = 100% Renewable
U.S. = U.S. Electricity Supply
E85 = 85% Blend Ethanol

B85 = 85% Blend Biodiesel
HybGas = Hybrid Gasoline
Li-Ion = Lithium Ion

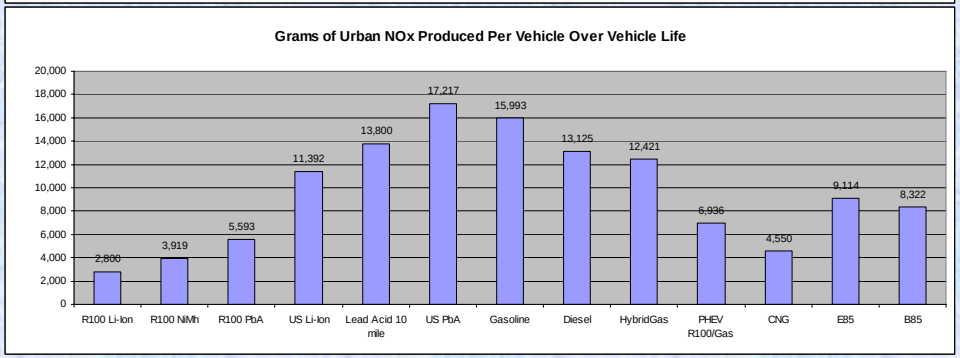
PHEVGas = 20 Mile Li-Ion Plug In Hybrid Powered by Gasoline and R100
CNG = Compressed Natural Gas

NiMH = Nickel Metal Hydride
PbA = Lead Acid
Equivalent Gallon = Gallon of Gasoline

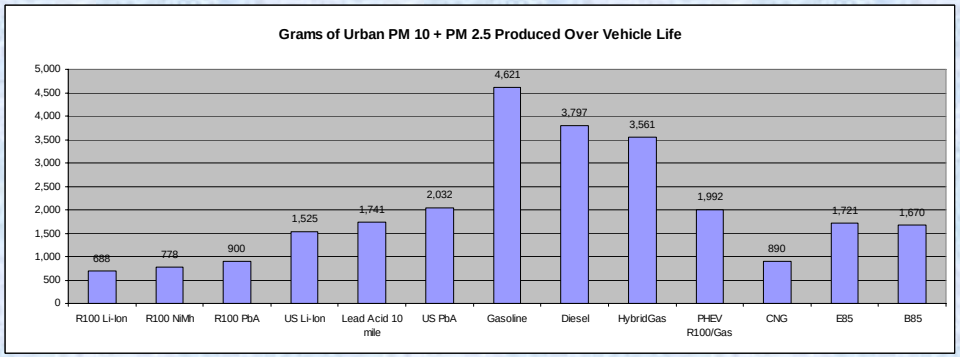
Fossil Fuel Consumtion



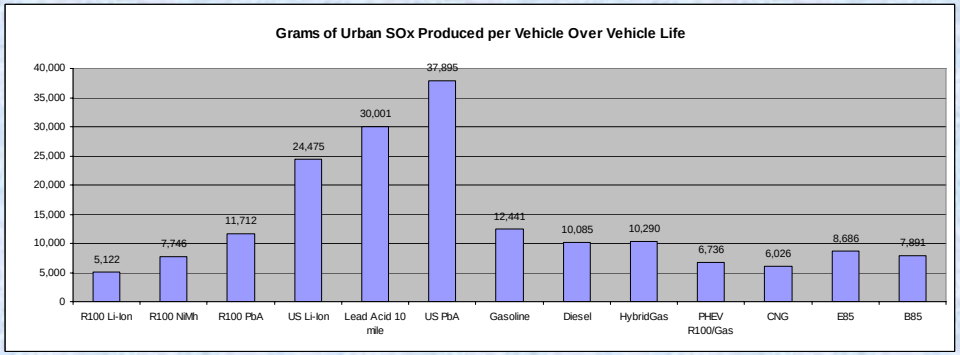
NOx Production



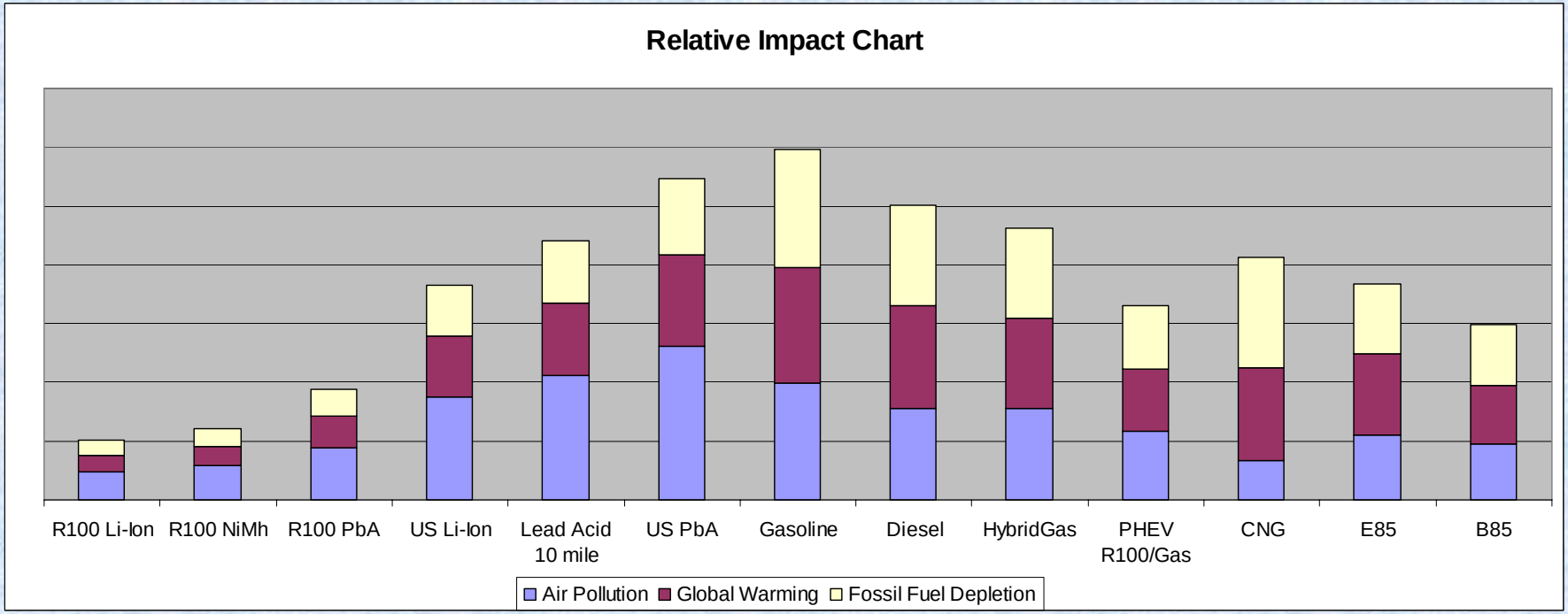
Particulate Matter Production



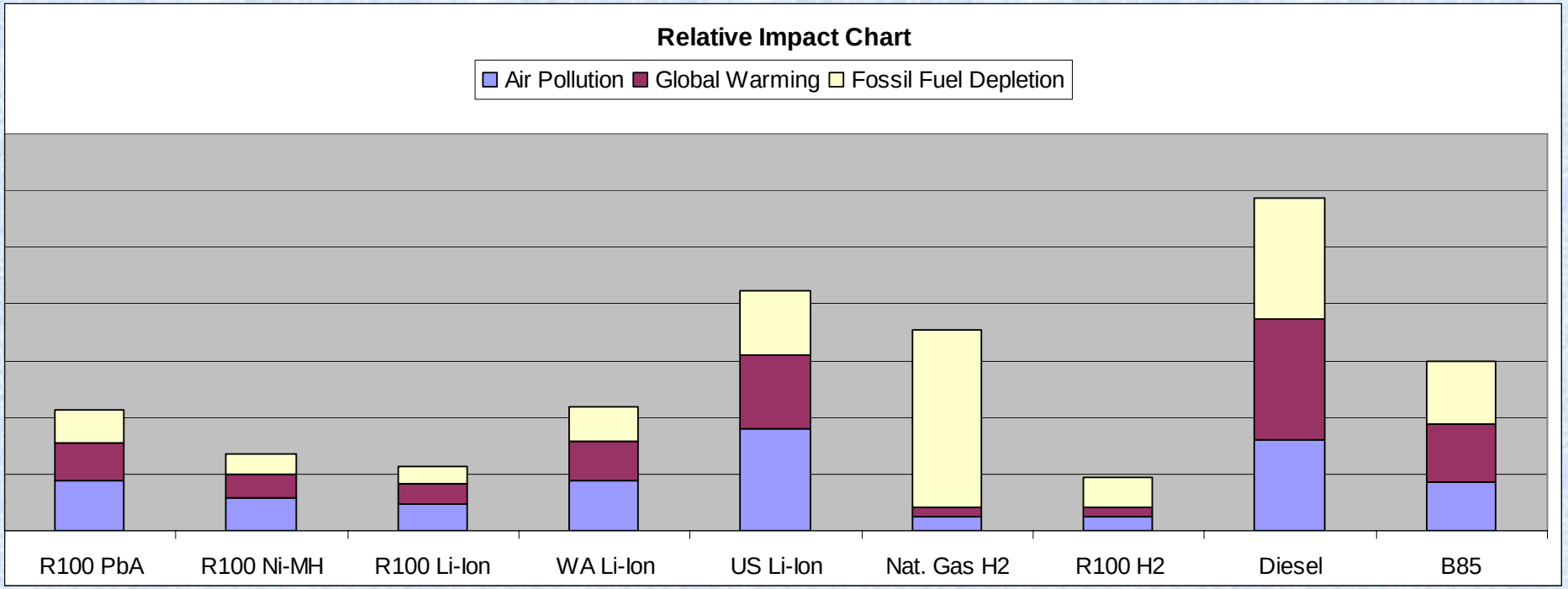
Sulfur Dioxide Production



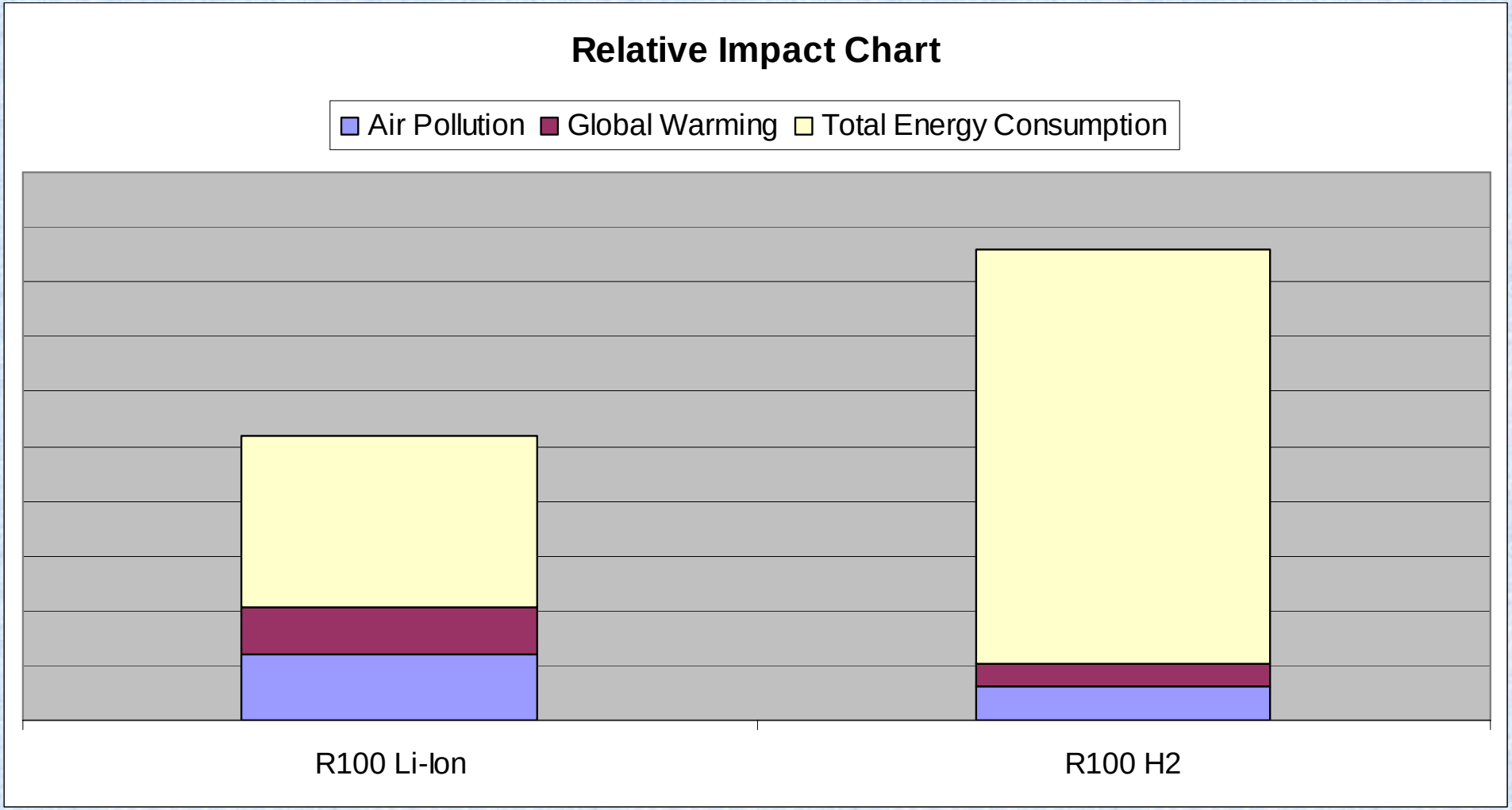
Combining the Data



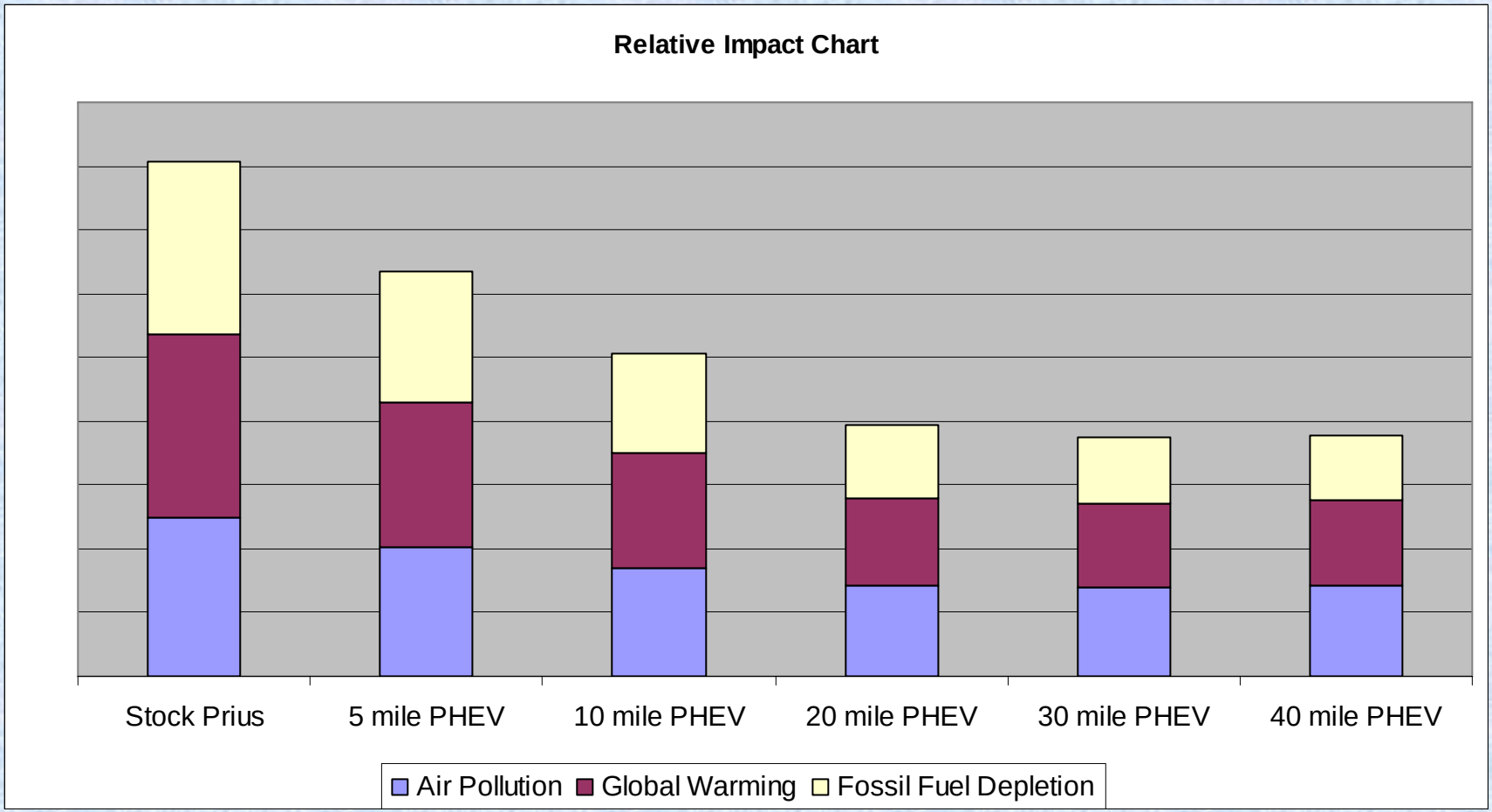
Powering a Ford Ranger



Hydrogen vs Lithium Ion



Comparing Different Range Li-Ion PHEV



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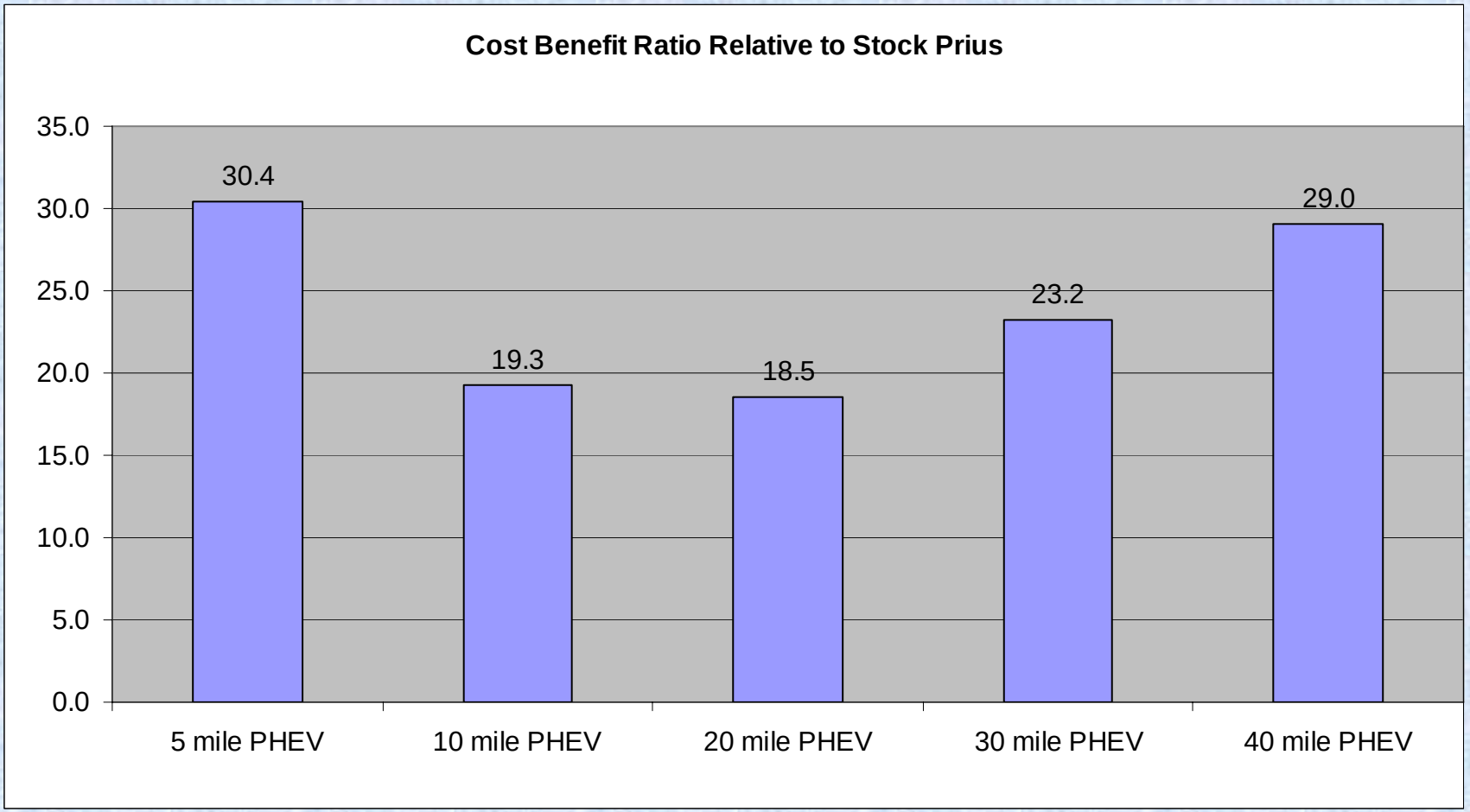
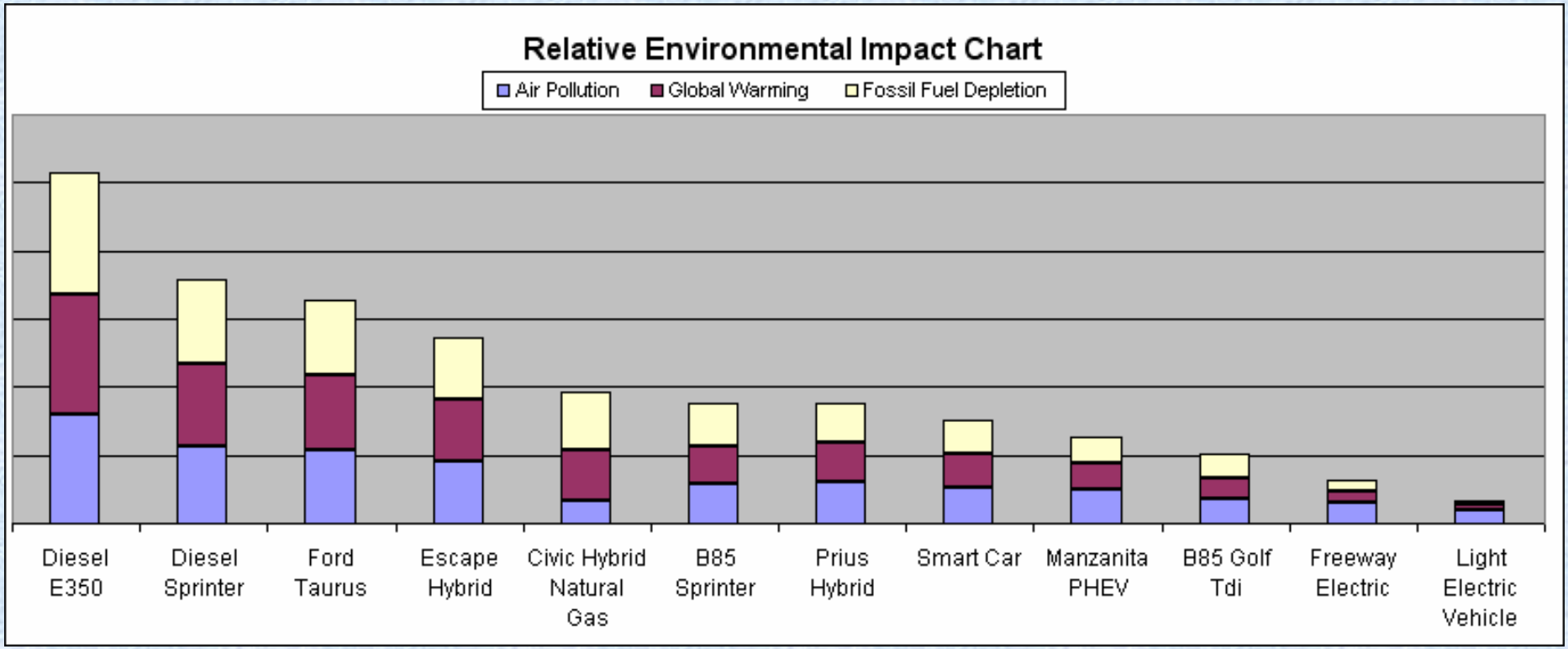


Comparing Vehicle Options



Relative impact of Global Warming, Fossil Fuel Depletion, and Local Air Pollution all weighted as equals for a 25 mpg gasoline vehicle.

For more Information

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