Mobile Source Emissions Reduction Strategies For the NYMTC Region

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Overview

What are the strategies?

Why were they of research interest?

Findings

Conclusion

Four Vehicle Technologies

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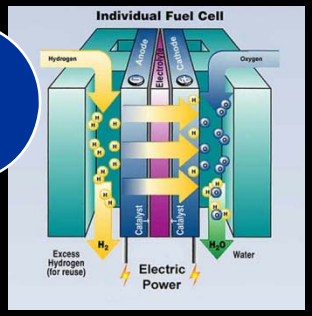
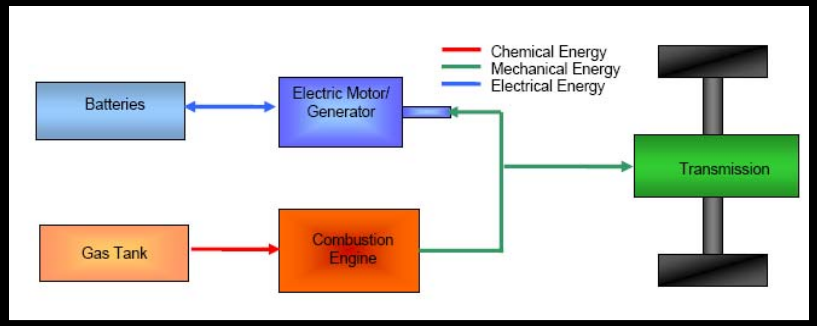
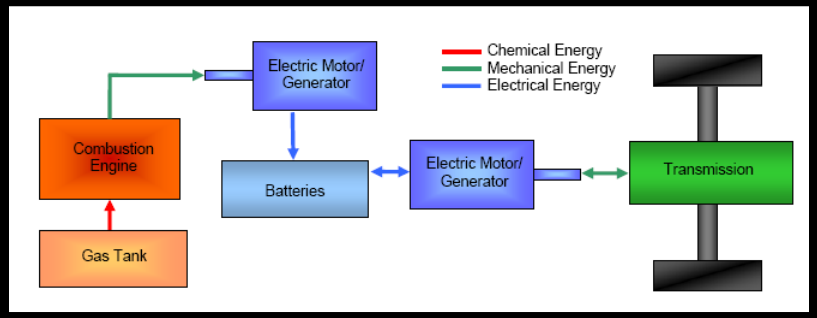


Hybrid Electric





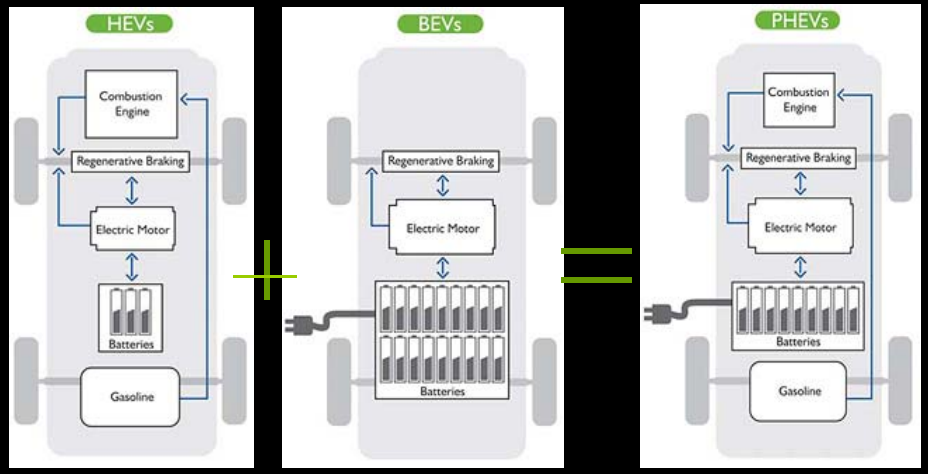
Incoming Buses

Area	Reduction with Incoming Hybrids (tons/year)		
	CO2	PM	NOx
NYC	198,251	102	542
Westchester	21,705	11	59
Rockland	5,989	3	16
Putnam	2,178	1	6
Nassau	27,292	14	75
Suffolk	30,225	15	83

All Buses

Area	Reduction if All Vehicles Hybrid (tons/year)		
	CO2	PM	NOx
NYC	6,608,377	3,385	18,052
Westchester	723,487	371	2,578
Rockland	199,628	102	1,000
Putnam	72,607	37	480
Nassau	909,717	466	16,494
Suffolk	1,007,495	516	2,921

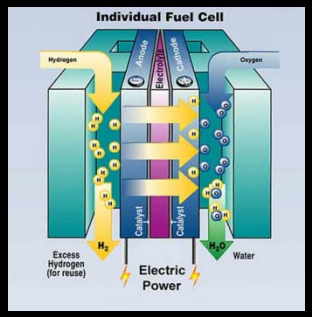
Plug-In Hybrid



	Electric Mode (grams/mile)			Hybrid Mode (grams/mile)		
	CO2	PM	NOx	CO2	PM	NOx
Passenger car	73%	14%	88%	35%	35%	35%
SUV	74%	18%	88%	35%	35%	35%
Truck	86%	50%	93%	65%	61%	61%
Transit bus	87%	54%	93%	22%	13%	13%
School bus	79%	24%	89%	64%	60%	60%

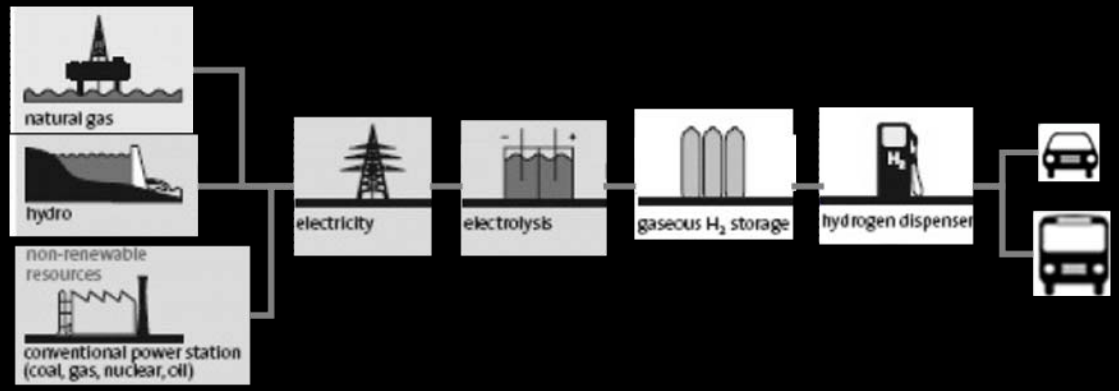
	Years to Payback
Passenger car	7.6
SUV	5.8
Truck	8.7
Transit bus	3.5
School bus	5.2

Hydrogen



Natural Gas

Electrolysis



Hydrogen (Continued)

Natural Gas

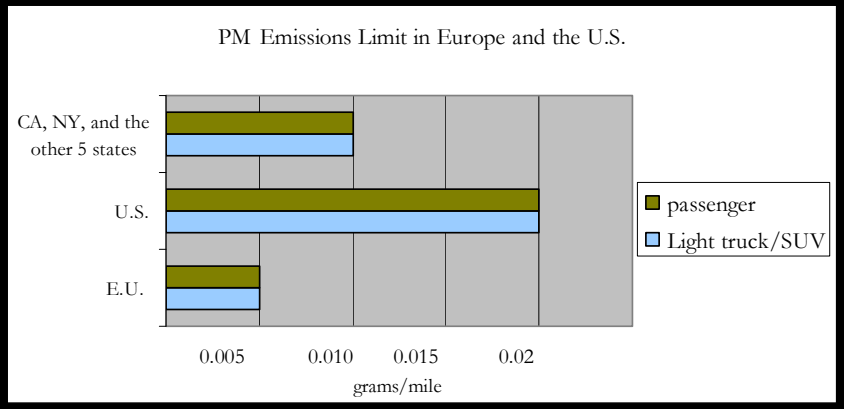
	CO2	PM	NOx
	grams/mile		
Passenger car	-55.0%	-99.8%	-98.3%
SUV	-50.8%	-99.8%	-98.2%
Transit bus	-38.3%	-99.7%	-97.5%

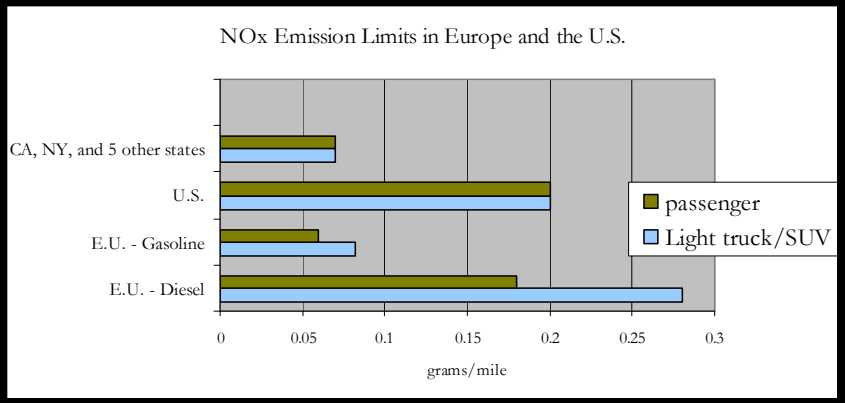
	Years to Payback
Passenger car	45
SUV	79
Transit bus	35

Electrolysis

	CO2	PM	NOx
	grams/mile		
Passenger car	-3.3%	207.6%	-55.5%
SUV	5.8%	159.5%	-51.3%
Transit bus	32.5%	-100.0%	-32.5%

Clean Diesel





	Premium Cost ($)	Savings ($/yr)	Years to Payback
Passenger car	$17,100	262	65.2
SUV	$10,425	300	34.8

Conclusions

Hybrids → significant emissions reductions

Plug-In Hybrids → ready for implementation, 5-10 years

Hydrogen Fuel Cell Vehicles → ready for implementation 20+ years

Clean Diesel → not ready today; emissions standards more strict than Europe