DAIMLER

OSU / Daimler Truck Research Lab

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Salem, OR
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Mercedes-Benz FREIGHTLINER FUSO WESTERN STAR Thomas BUILT BUSES BHARATBENZ

Daimler AG

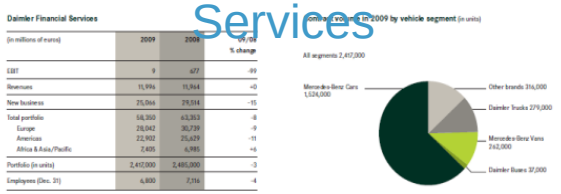
Mercedes Benz Cars

Daimler Trucks &

Daimler Buses

Mercedes Benz Vans

Daimler Financial Services



Daimler Financial Services (in millions of euros)	2009	2008	09/08 % change
EBIT	9	677	-99
Revenues	11,996	11,964	+0
New business	25,066	29,314	-15
Total portfolio	58,350	63,353	-8
Europe	28,042	30,739	-9
Americas	22,902	25,629	-11
Africa & Asia/Pacific	7,405	6,985	+6
Portfolio (in units)	2,412,000	2,485,000	-3
Employees (Dec. 31)	6,800	7,116	-4

DAIMLER U.S. Sites, Revenue and Employees

DAIMLER locations across the USA

DTNA brands in the U.S.

FREIGHTLINER · DETROIT · Thomas BUILT BUSES · WESTERN STAR

OR
Daimler Trucks HQ and Western Star Plant (4,549)
Portland

MN
Diesel Reman (100)
Hibbing

MI
MBFS HQ Farmington Hills (350)
Detroit Diesel HQ/Plant/Reman/Purem (2280)
Detroit
MB R&D NA Redford (66)
Ann Arbor (19)

NY
Detroit Diesel-Allison (50)
MBUSA (230)

CT
Detroit Diesel-Allison (36)

NJ
MBUSA HQ (900)
Detroit Diesel-Allison (159)
Freightliner PDC (90)
MBUSA PDC (97)

NV
Freightliner PDC (40)
Reno

OH
DDC Reman (525)
Cambridge
DDC PDC (170)
Canton

MD
MBUSA VPC (65)
Baltimore

CA
M-B R&D NA (170)
Palo Alto, Long Beach, Carls
M-B Driving Academy – Los Ang
MBUSA VPC - Los Angeles

NC
Freightliner: 4 Plants
(6,465)

TN
tliner PDC (175)
Memphis

SC
DTNA – Ft. Mill (425)
Freightliner – Gaffney (560)
Sprinter – Ladson (100)

GA
Freightliner PDC (76)
Duluth
MBUSA VPC (37)
Brunswick

TX
MBFS (450) - MB PDC (46)
Dallas/Ft. Worth
car2go HQ (20)
Austin

AL
MBUSI (2,930)

FL
MBUSA/MBFS
Jacksonville (150)
Detroit Diesel-Allison (344)
9 locations

Cleveland	(2290)
Mt. Holly	(1595)
Gastonia	(1270)
High Point	(1310)

U.S. (2013)

Revenue	$39.4B
Employees	20,993

car2go: Austin – San Diego – Miami – Portland – Seattle - Washington, DC

Inventor of the Automobile and…

1885 Gottlieb Daimler's invention of an upright single-cylinder four-stroke engine

1886 Carl Benz's invention of a three-wheeled "Motorenwagen"

1959 World's first safety body with robust passenger cell and integrated crumple zones for passenger car

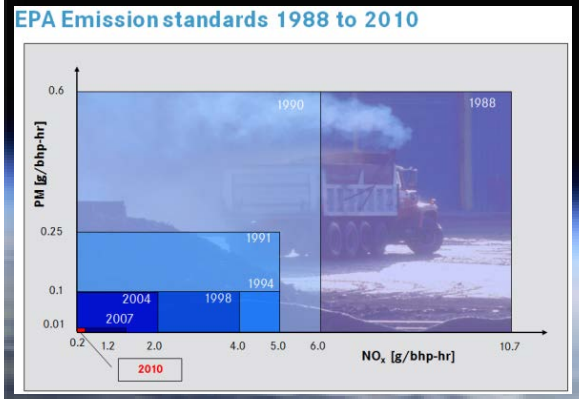
1978 World premiere of anti-lock braking system (ABS) for passenger cars
First ABS for commercial vehicles in

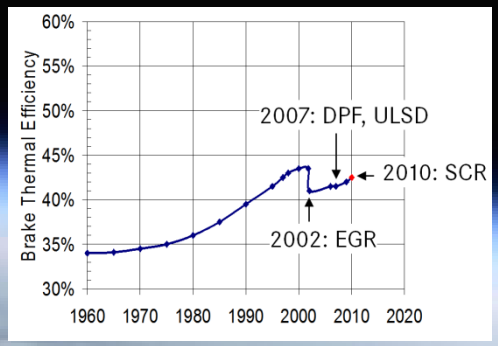
1987 First acceleration skid control (ASR) system for commercial vehicles

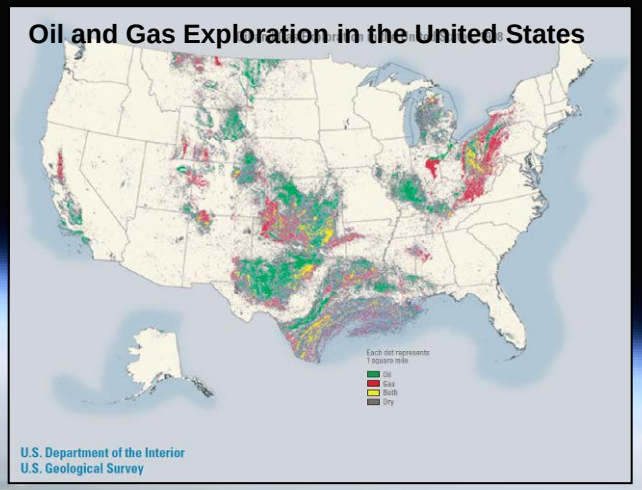
2000 First Lane Keeping Assist system for trucks

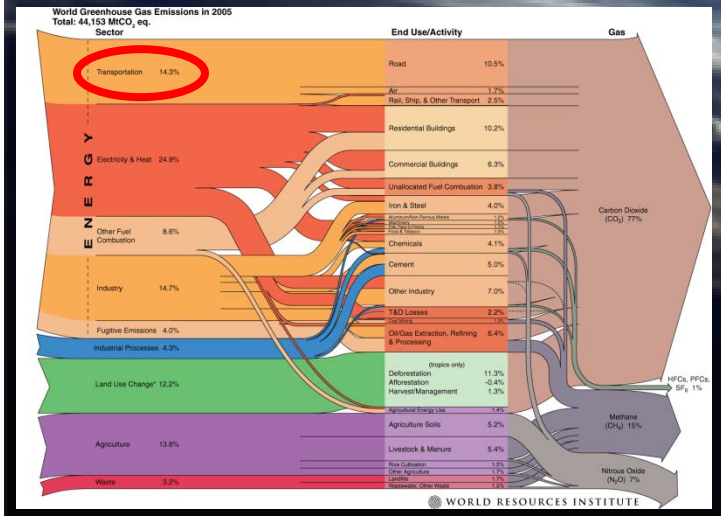
Daimler Trucks North America ("DTNA") continues to maintain a strong commitment to the safety and fuel efficiency of our vehicles which support both economic productivity and to protect the human and natural environment. This is demonstrated by our history of being first to market with many safety technology systems including antilock brake systems in 1987, obstacle detection systems in 1996, driver airbags in 1998, stability control systems in 2002, lane departure warning systems in 2006, seat belt pre- tensioners and side airbag systems for rollover protection in 2007, and adaptive cruise control and collision avoidance systems in 2007.

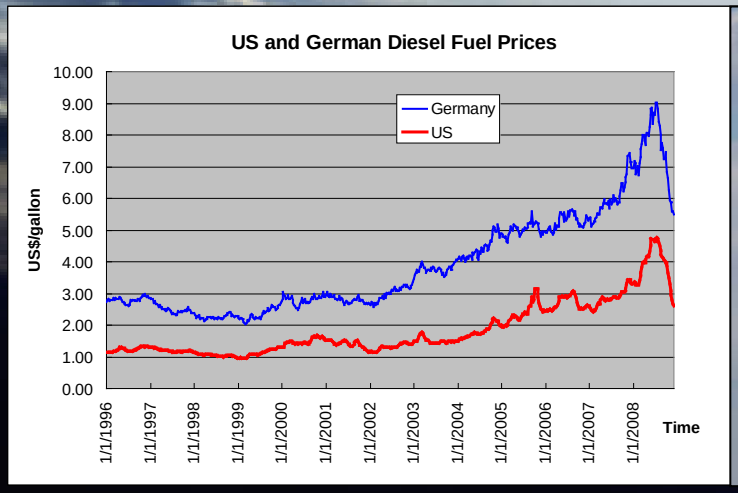
Changed priorities - Transition from emission regulations to $C0_2$ footprint & fuel economy











Department of Energy SuperTruck Project Goals

Project Target

Develop and demonstrate vehicle and advanced engine technology for Heavy-Duty Class 8 Trucks as follows:

- 50% improvement in “freight efficiency” (measured in ton-miles per gallon for a Class 8 vehicle weighing 65,000 lbs)
- 20% improvement in “engine brake thermal efficiency” (50% BTE)
- Modeling and analysis for pathway to 55% Brake Thermal Efficiency

Funding

- Federal awards: $39.6M (with $40M DT matching) over 5 years (2010-2015)
- Stimulus money awards based in part on number of jobs created or retained
- Pairing with partners or subcontractors encouraged

SuperTruck Video

Daimler Trucks has the Leading SuperTruck Results

115%
Freight efficiency improvement

12.2 mpg

50.2%
Brake thermal efficiency

Road to 50% Improvement

A-Sample *(Performance Test, April 2014)*
- Aero hood, bumper, active grille
- Stock DD11 Engine, DT12 DD Trans. + eCoast
- Waste Heat Recovery (electrical expander & vehicle cooling)
- 6x2 Axle Config, 2.28:1 RAR + oil baffle
- GHC Hybrid B-sample (120kw eMotor, 360v, 2.4 kw-hr Li-Ion Bat)
- eHVAC (HV compressor, remote condensor, electrical fan)
- eMotor engine start
- Cab insulation package
- Clutched air compressor / electronic air control
- AccuSteer (closed center steering gear + a
- Low rolling resistance wide based single ti
- Thermal mgt. (variable speed fan, water pu
- Trailer aero., lightweighting and solar

A-Sample

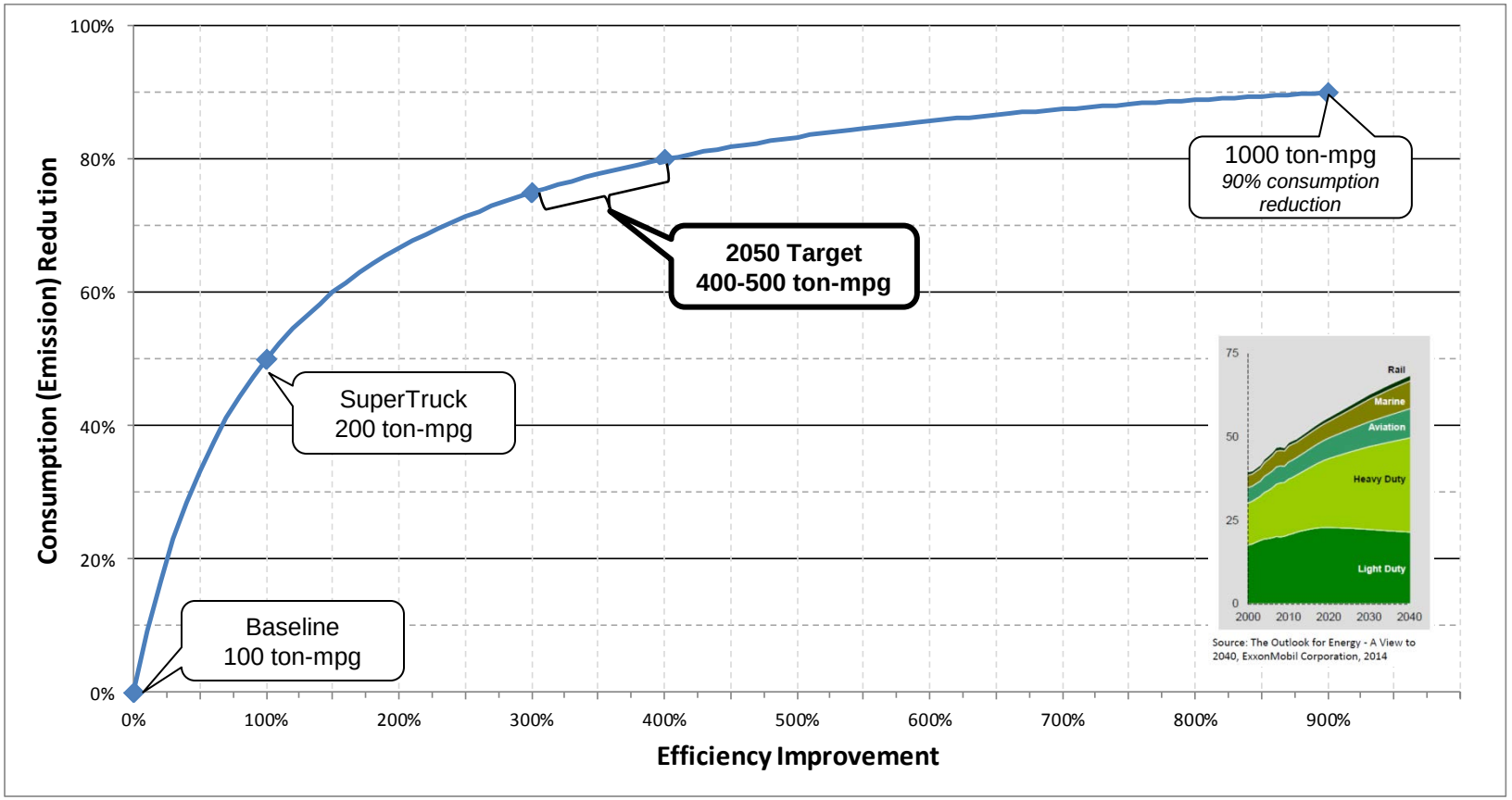
Tinker Trucks

Final Demonstrator

Final Demonstrator *(FE Test, Oct 2014 – Jan 15)*

A-Sample Technologies, plus…
- Full Tractor Aero
  - *cab/sleeper, underbody, drive wheel fairing, mirror cam, steer wheel, full side extender*
- 50% BTE DD11 Engine + WHR
- Predictive hybrid controller
- Predictive engine controller
- New final drive active oil management with FE gear oil
- Lightweight Aluminum Frame and cross members
- Ultra Lightweight Air Suspension
- Advanced Loadshift 6x2
- Solar reflective paint
- Enhanced Trailer aerodynamics

2050 GHG Targets Require a Significant R&D Push



Energy Losses in Engine/Vehicle

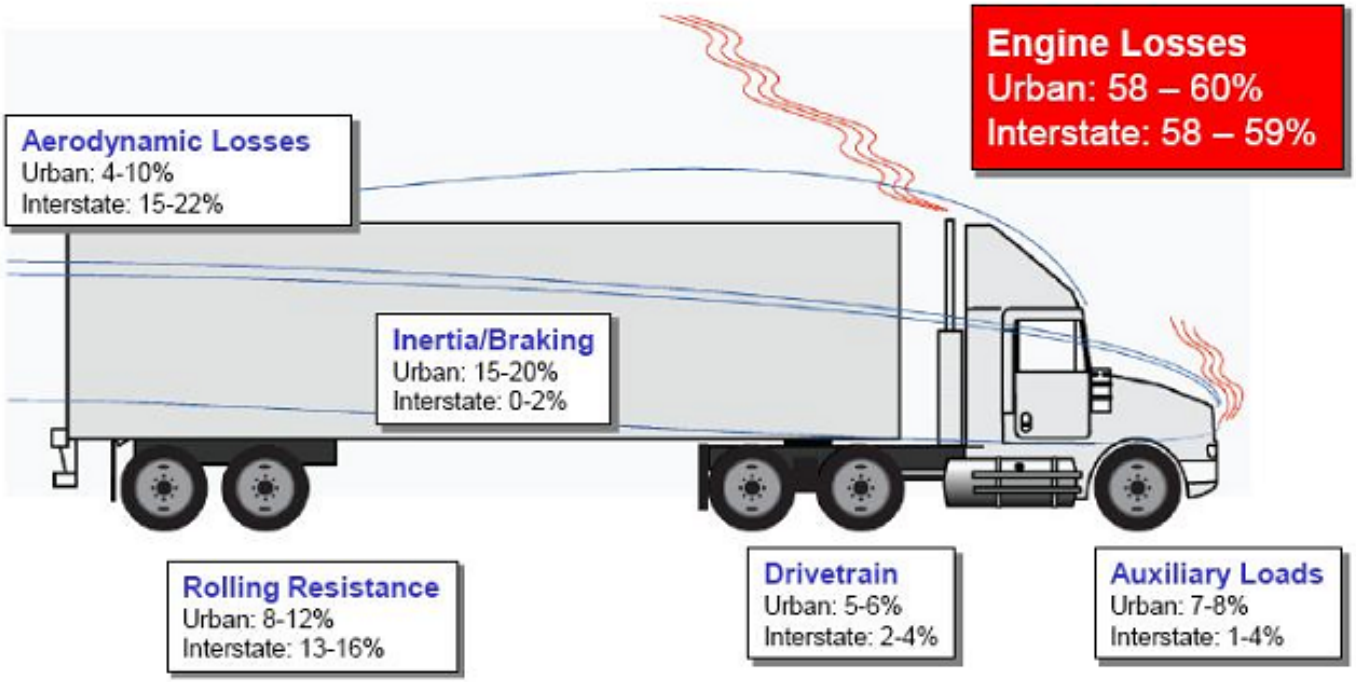


FIGURE 2-7. Energy "loss" range of vehicle attributes as impacted by duty cycle, on a level road.

Source: Technologies and Approached to Reducing the Fuel Consumption of Medium and Heavy Duty Vehicles, National Research Council of the National Academies, 2010

Truck Research Lab

Oregon State University / Daimler Trucks North America

3-year pilot program proposed (*Sept 2015 - June 2018*)

- 2 Graduate fellowships
- Multiple undergraduate capstone programs (senior projects)

Research focus on fuel efficiency of Class 8 Trucks

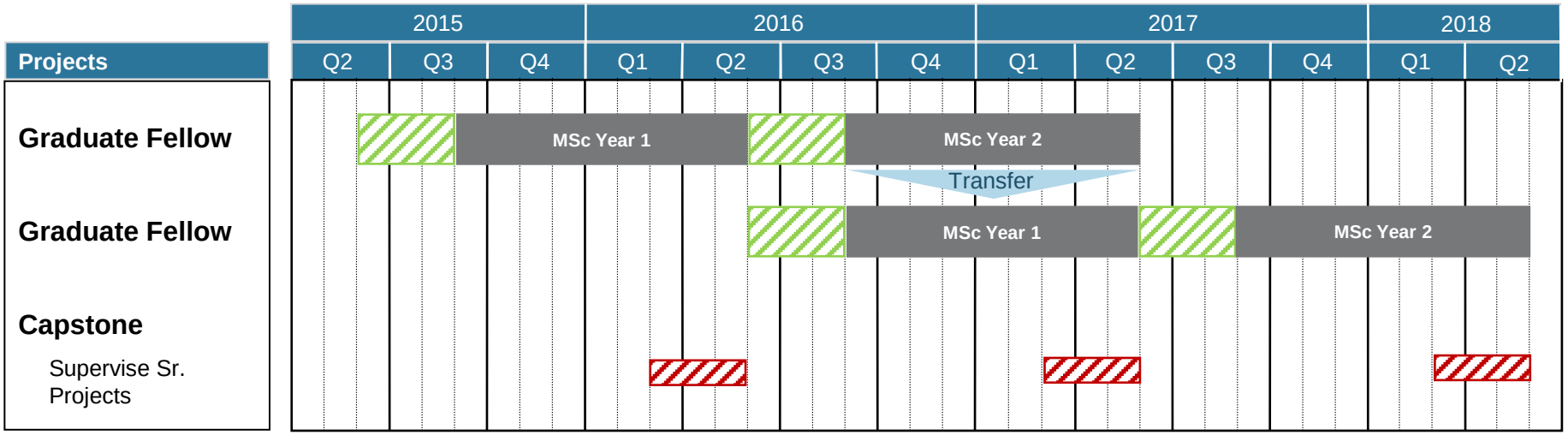
Daimler Commitments

- Definition research topics
- Gift of class 8 tractor (*incl. title transfer*)
- Access to relevant engineering data CAD
- Summer internships to graduate student

OSU Commitments

- Provision of facilities for tractor and CAD systems (e.g. NX)
- Provision of tools and materials for parts fabrication
- Faculty oversees graduate students and facilities
- Coordinate and oversee undergraduate capstone programs

Three Year Daimler Oregon State University Proposal



Legend

- Truck Lab Setup and Research (Location: OSU)
- Summer Internship (Location: Daimler)
- Undergraduate senior project supervision (Location: OSU)

Projected Budget

Fellowship Program (2 Graduate Fellowships)

Calendar Year			Pilot Program Total
2015	*2016*	*2017*	
$125,000	$250,000	$125,000	$500,000

Truck Research Laboratory

Category	Description	Requested Funds
Distributed TRL Equipment	Outfit existing labs for TRL to include: Fabrication, facilities test and equipment power	$750,000
TRL Director	Manage Lab Space and Research, educational projects	$250,000
TRL Matching Funds	1:1 match for research and education programs	$500,000
	Total:	**$2,000,000**