

# Cradle-to-Cradle

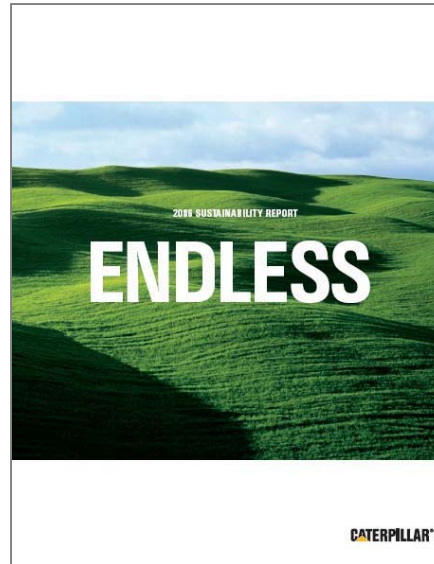
Achieving the Vision Through Remanufacturing

**Joe Allen**  
**General Manager**  
**Director of Sustainable Development**



**\$44.9 billion\*** in sales  
Distribution to more  
than 200 countries in  
23 time zones

Over 400 facilities  
in 50 countries



101,000 Employees  
181 Dealers  
120,000 Dir. Employees

Global customer  
support over  
multiple product  
life cycles



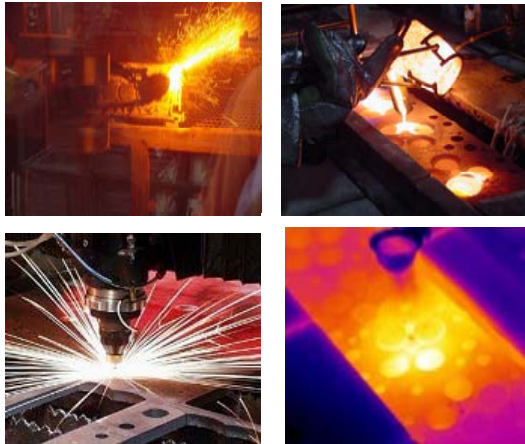
**Reduce**

**Reuse**

**Recycle**

\* 2007

## Remanufacturing... Advanced Recycling



**Remanufacturing:** The process of returning end-of-life products to original “same-as-new” condition in a manufacturing environment.



**30 years of Remanufacturing**

## ***The Reman Business Model...***

End-of-Life  
"Take Back"



Advanced Recycling  
Technology



New Material



Assembly & Test



***Products returned to original "same-as-new" condition - or better...***

## Remanufacturing...

## Same-as-new quality & warranty

## Fraction-of-New price

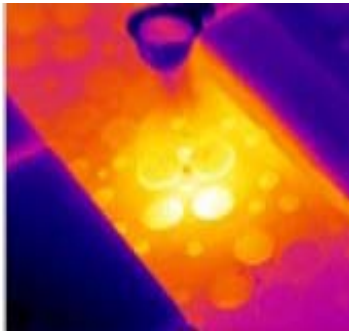


- 2.2 million units in 2007
- Over 7,000 part numbers
- 2 billion\* pounds returned per year
- 15 primary facilities in 8 countries
- Over 6,000 employees\*



\* Includes Progress Rail

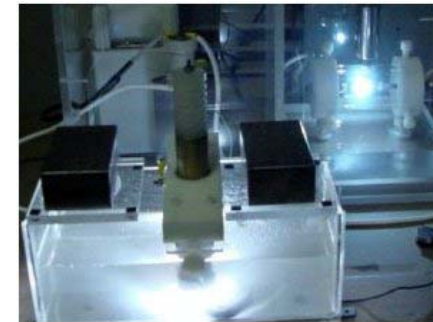
## *Investments in Technology & Systems...*



Head Recasting



Thermal Cutting



Shock Wave Cleaning



Metal Deposition



Thin Film Coatings



Molten Salt Bath Cleaning

*Products brought back to original “same-as-new” condition...*

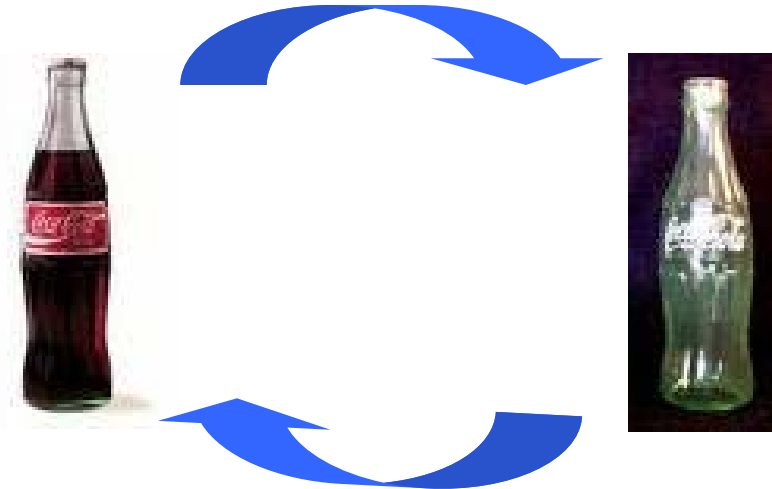
## Original “Same-as-New” Quality & Performance



	<u>New</u>	<u>Reman</u>
Engineering prints	✓	✓
Same-as-New functional specs.	✓	✓
Manufacturing quality systems	✓	✓
Same-as-New factory warranty	✓	✓
<b>Design-for-remanufacturability</b>	✓	—

# A Commitment to "Take-Back"

Coke	\$1.00
Bottle deposit	\$0.25
<b>Total Cash Outlay</b>	<b>\$1.25</b>
<b>Bottle Return</b>	<b>(\$0.25)</b>
<b>Net Cost</b>	<b>\$1.00</b>



Exchange Transaction example

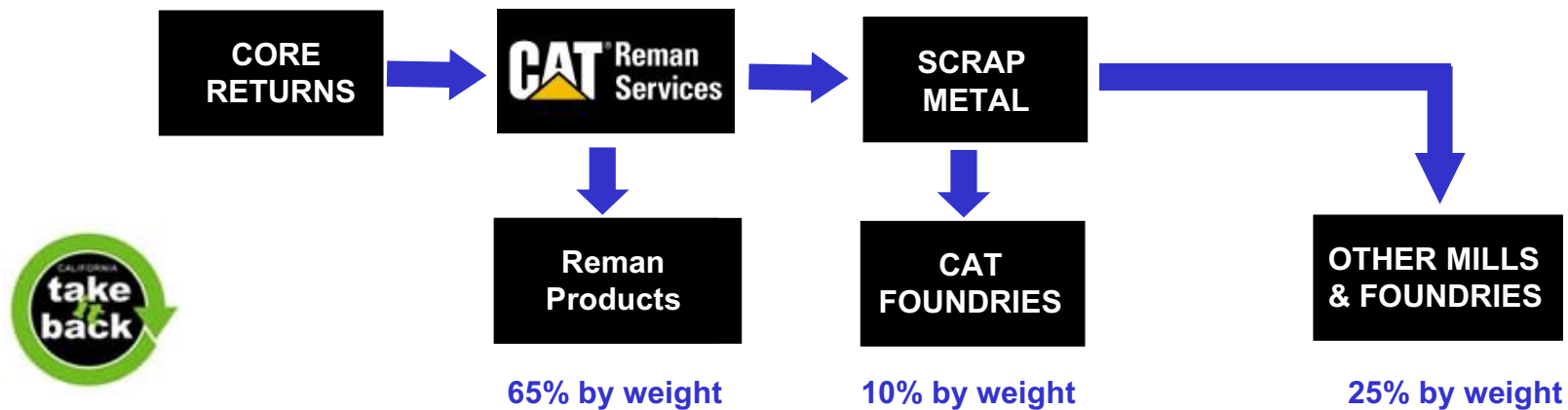


**No Return = No Reman**

## Extended Producer Responsibility...

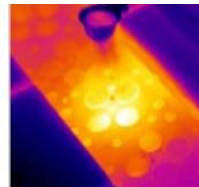
- 2.2 million “cores” returned in 2007
- Preservation of ~ 85% of original energy “value add”
- Approaching “zero landfill” status

End-of-Life Return Rates	
Reman	93%
New	0%



## *Favorable Environmental Footprint...*

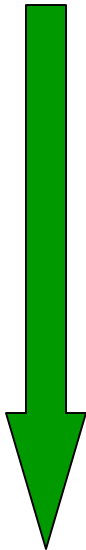
<u>Cylinder Head*</u>	<u>Reman vs. New</u>
GHG	61% less
Water use	93% less
Energy use	86% less
Safety	82% advantage
Material use	> 99% less
Landfill space	> 99% less



\* 2006 Cat study, 3412 cylinder head



**Less**



- Green House Gases
- Raw Material Use
- Landfill Waste
- Energy Use
- Water Use



- Extended Producer Responsibility
- Jobs
- Recycling
- Affordable Development
- Controlled Industrial Processes

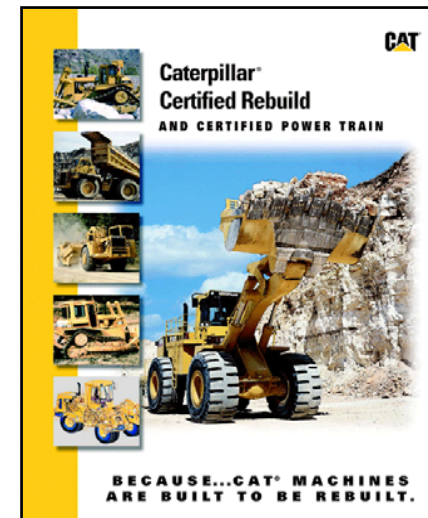
**More**

*The future...*



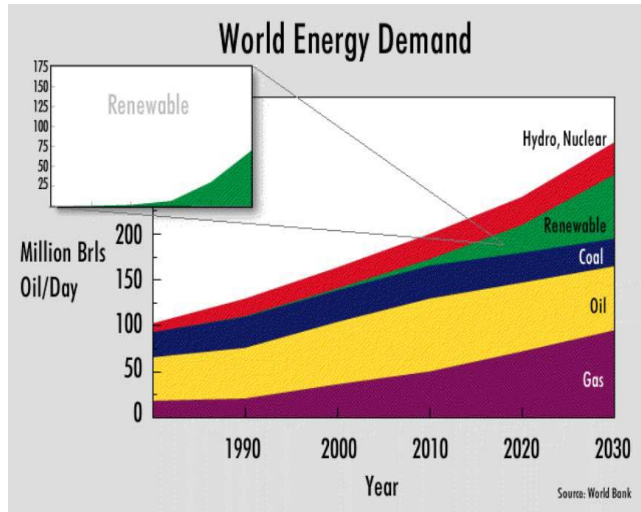
## *Cat Certified Rebuilds...*

- Engineering specifications
- Product upgrades
- Dealer labor
- New parts
- Remanufactured parts
- Fully warranted



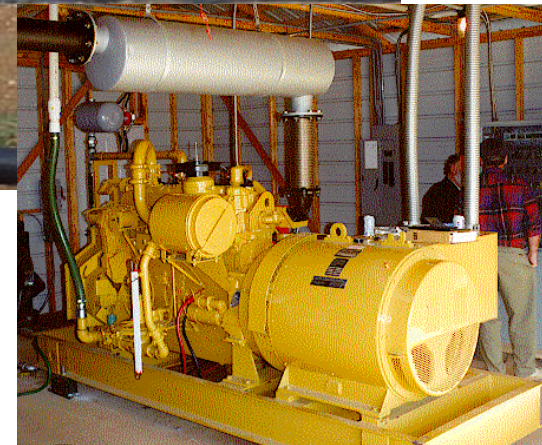
## Biogas gen sets...

Remanufacture diesel truck engines  
into methane fueled generators



Methane Capture - Hog Farm - Philippines

## Next Generation Reman





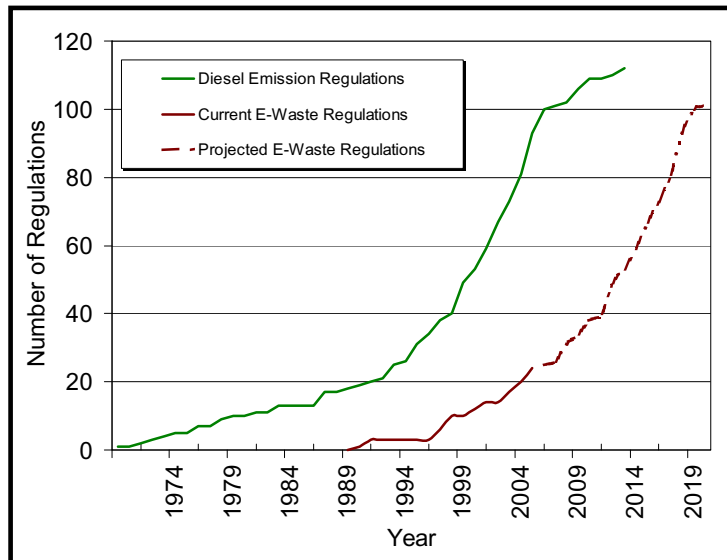
e-Waste – a global problem

## Cat “Zero e-Waste” initiative...



- Utilize the Reman “take back” model
- Sell electronics on an exchange basis
- Remanufacture returned e-cores
- Recycle unusable e-cores

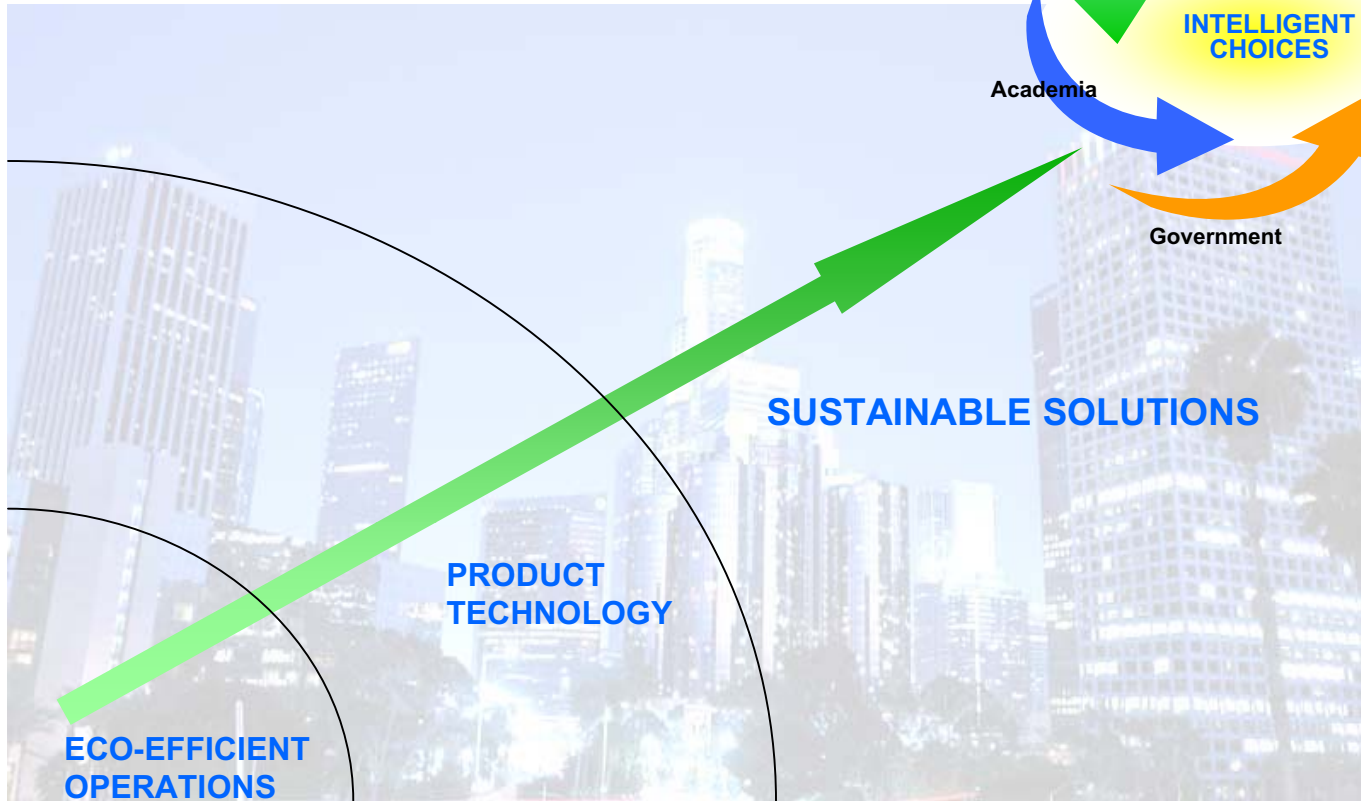
### Increase in Environmental Regulatory Laws



## Next Generation Reman

## “Cradle-to-Cradle” Life Cycle Focus...

INCREASING ENVIRONMENTAL BENEFIT



INCREASING ECONOMIC VALUE

# Remanufacturing...

Good for Society

Good for Business

Good for the Environment

