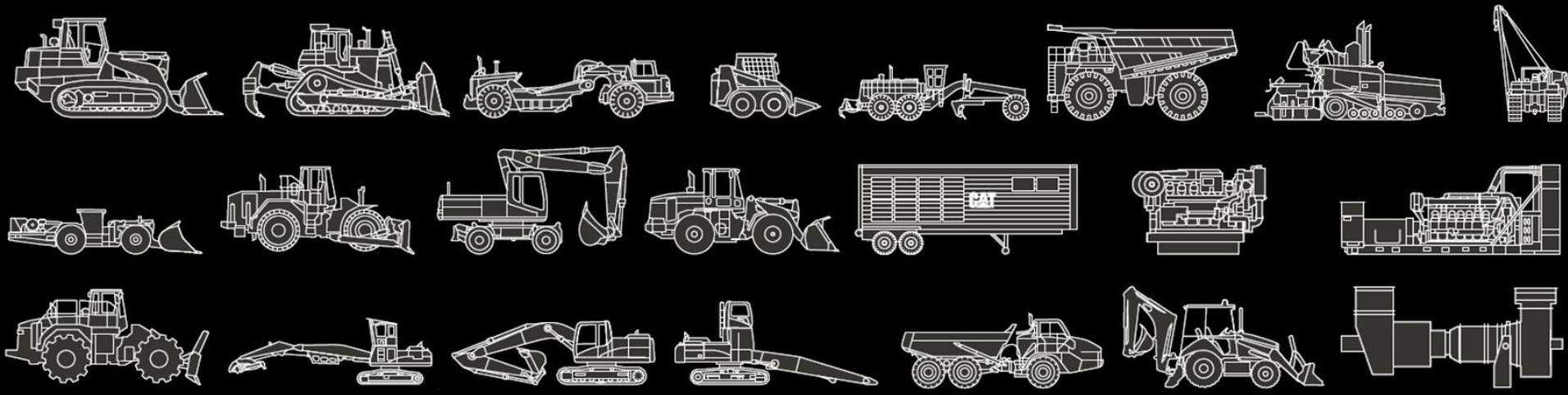


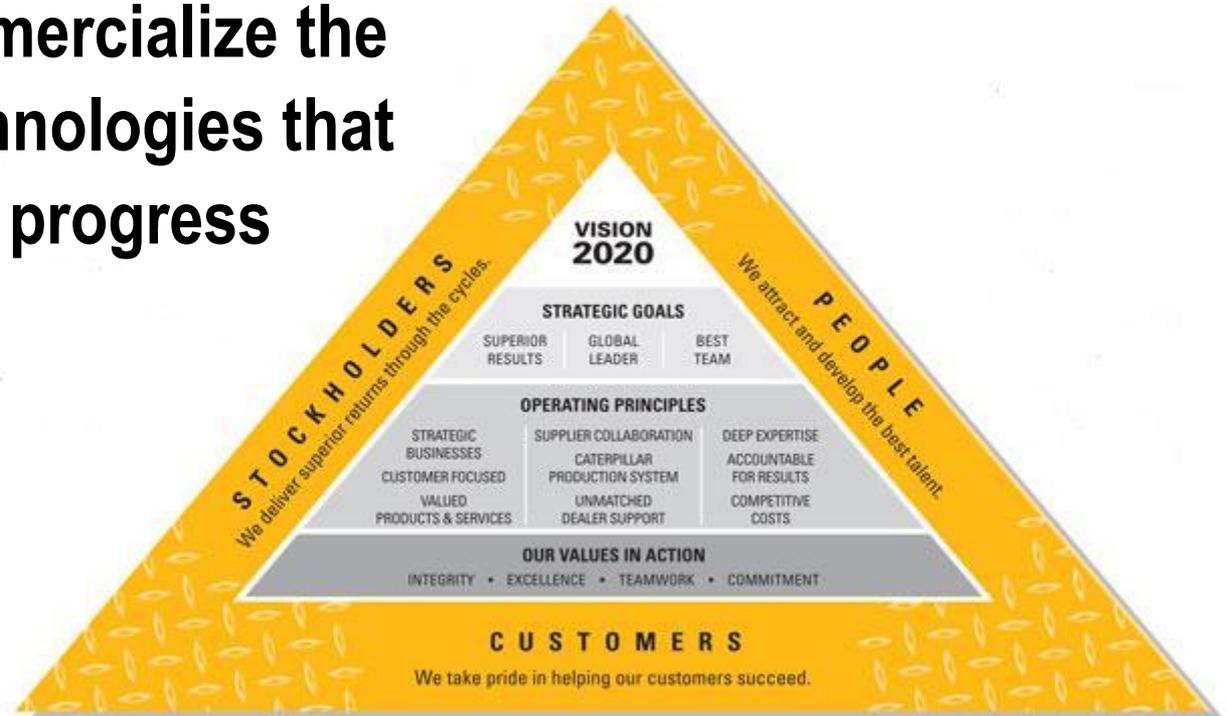
The Path from Innovation to Production

Jim Halloran – Western Region Manager

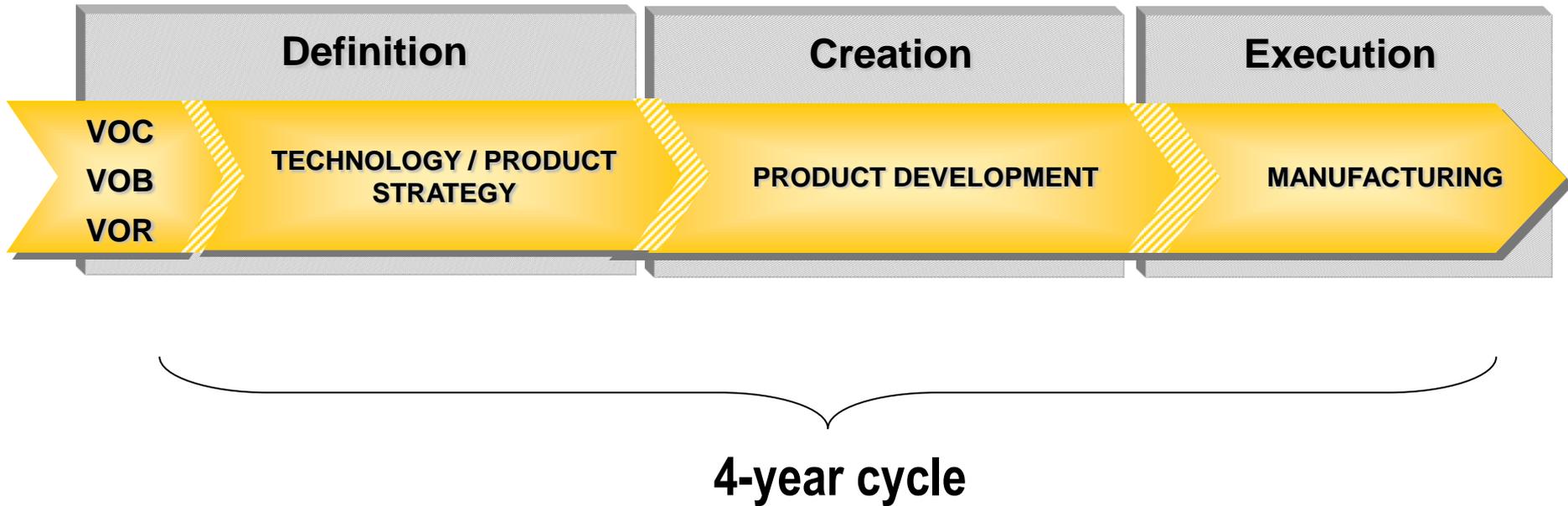


Product Development:

The process by which we select, develop and commercialize the products and technologies that make sustainable progress possible.



The Product Creation Value Stream



Three Key Voices

VOC (customers)

- Productivity
- Efficiency

VOB (industry)

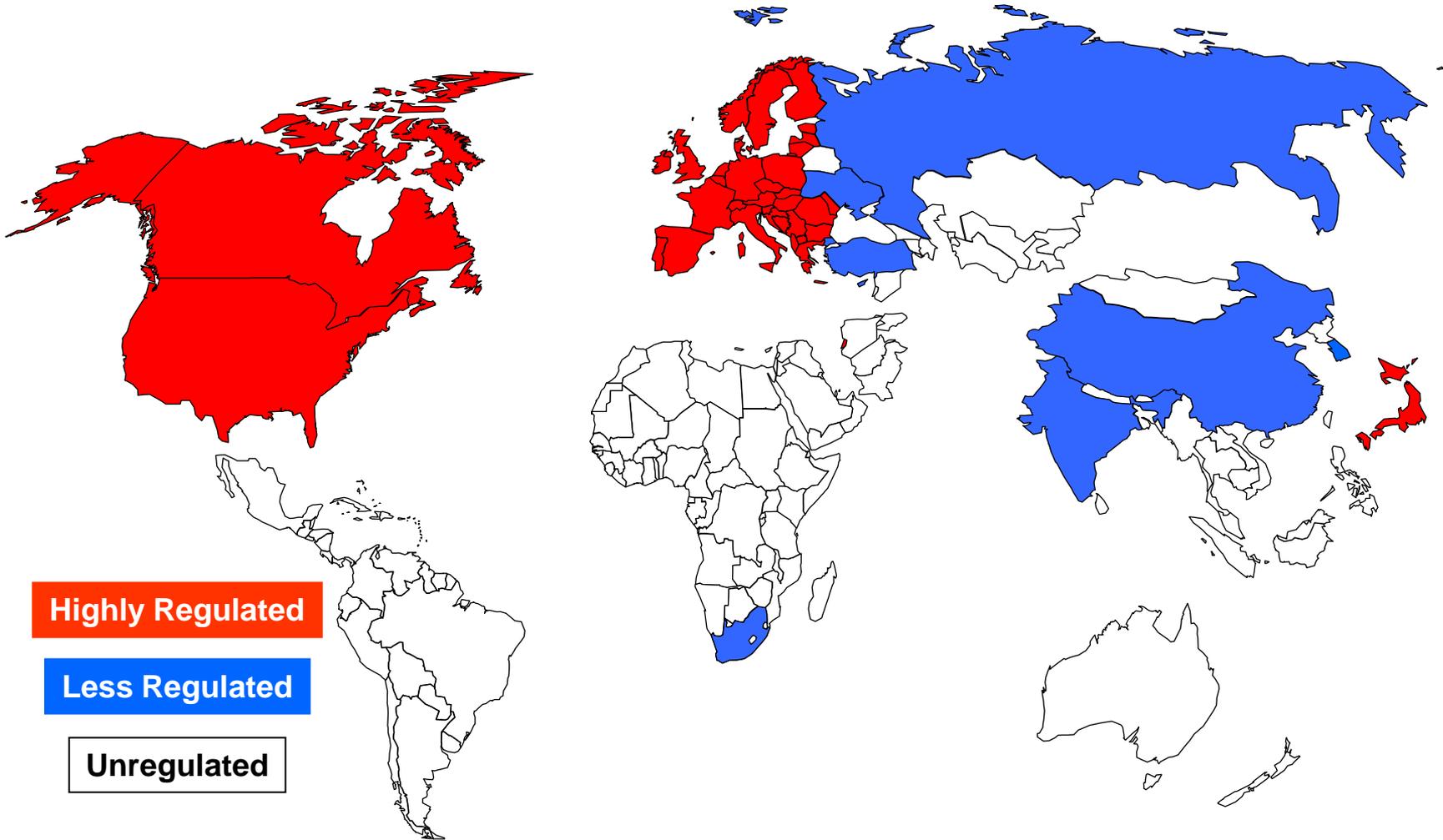
- Profitability
- Sustainability

VOR (society)

- Risk management



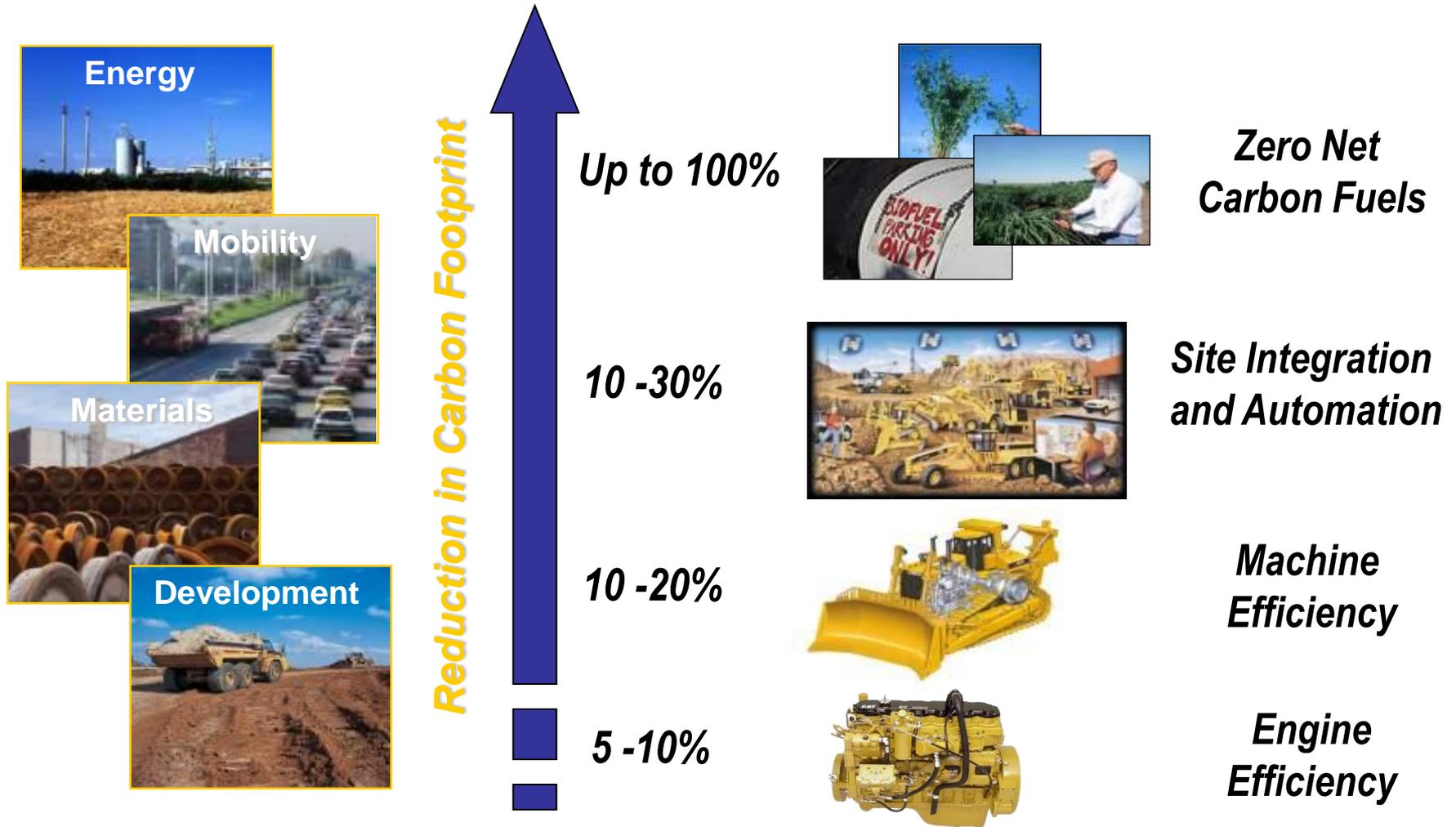
A Complex Marketplace...



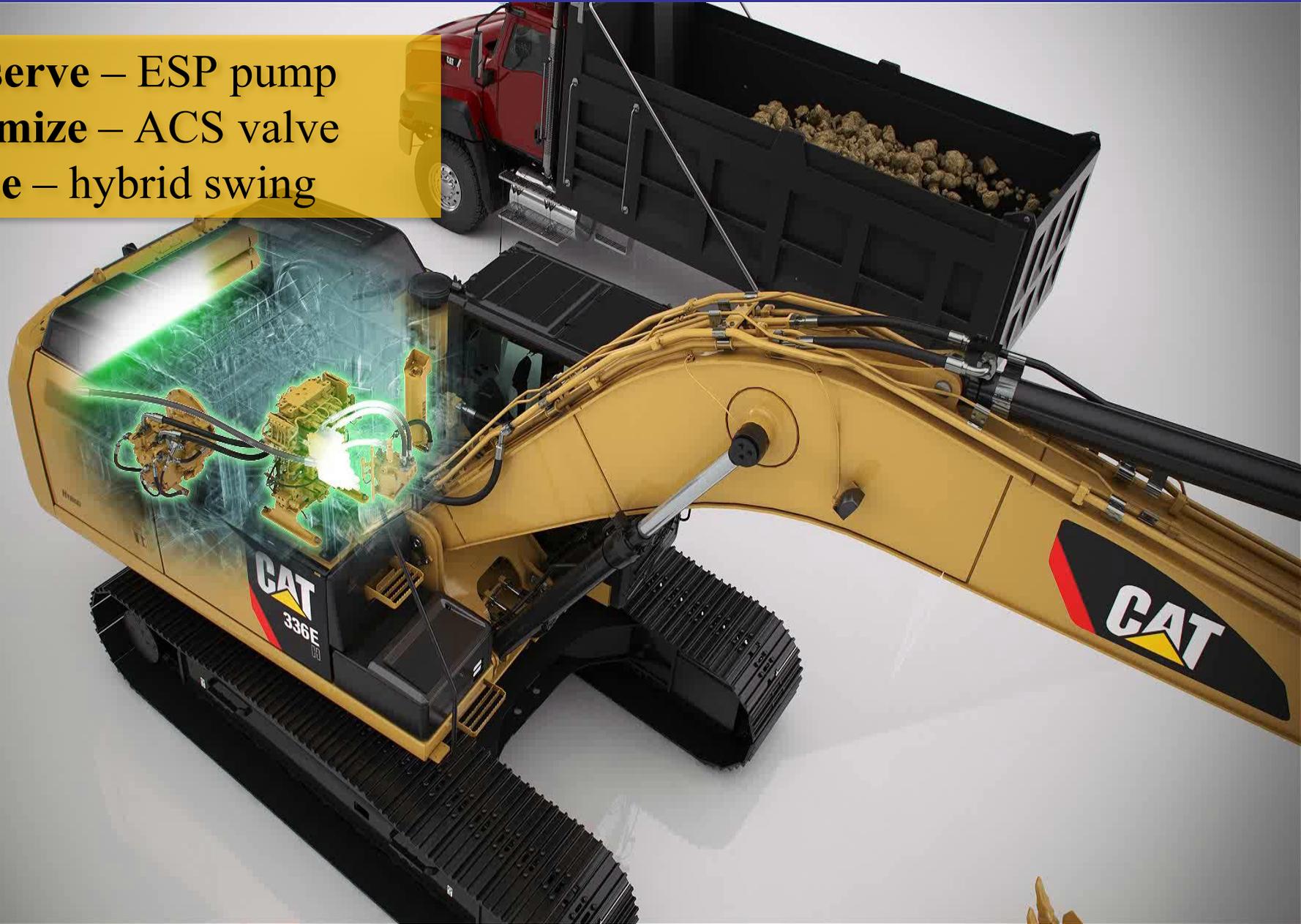
A Complex Marketplace... *drives product complexity*



Technology Trajectory: Fuel Efficiency



Conserve – ESP pump
Optimize – ACS valve
Reuse – hybrid swing



Greater Fuel Efficiency – 336E Hybrid Excavator



Up to
50%

Greater fuel efficiency *

* Tons/Liter compared to 336D

Up to
25%

**Less fuel consumption than
336E—the fuel economy and
performance leader in its class**

Up to
33%

Less fuel consumption than 336D

*Additional factors, such as operator skill and jobsite conditions can also affect fuel economy.

Cat D7E

10% lower
lifetime operating costs

50% less
operator noise

50% better
steering performance

Easier to operate

No shifting
Low-effort controls

Less fluids used

35%–70% lower
owning & operating costs with
SystemOne™ undercarriage

35% more
visibility

10% more
material moved per hour

Up to 20% less
fuel consumed per hour

25% more
material moved per gallon of fuel

Up to 50% longer life
for the electric drive train

Less down time
No engine belts

60% fewer moving parts
in the electric drive train

Grade Control Ready
Factory-installed AccuGrade® ARO



CAT[®] CONNECT



EQUIPMENT
MANAGEMENT



PRODUCTIVITY



SAFETY



SUSTAINABILITY

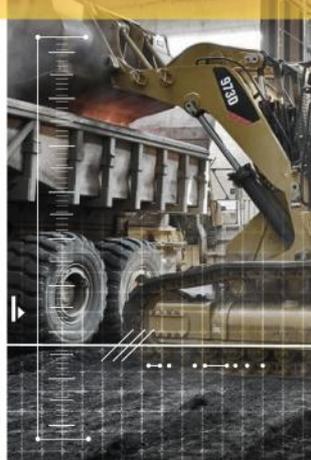
CONSTRUCTION



QUARRY



INDUSTRIAL



PAVING



WASTE



FORESTRY



Job Site Efficiency and Productivity

Reducing Emissions by Focusing on Fuel Efficiency Increases at the Site Level

Cat Connect Technologies



LINK

ACCESS MACHINE DATA TO INCREASE JOBSITE EFFICIENCY.



GRADE

IMPROVE GRADING ACCURACY WHILE CUTTING COSTS.



COMPACT

ACHIEVE AND DOCUMENT CONSISTENT RESULTS.



PAYLOAD

MEASURE MATERIAL WEIGHTS AND OPTIMIZE PRODUCTIVITY.



DETECT

ENHANCE JOBSITE AWARENESS TO MINIMIZE RISK.

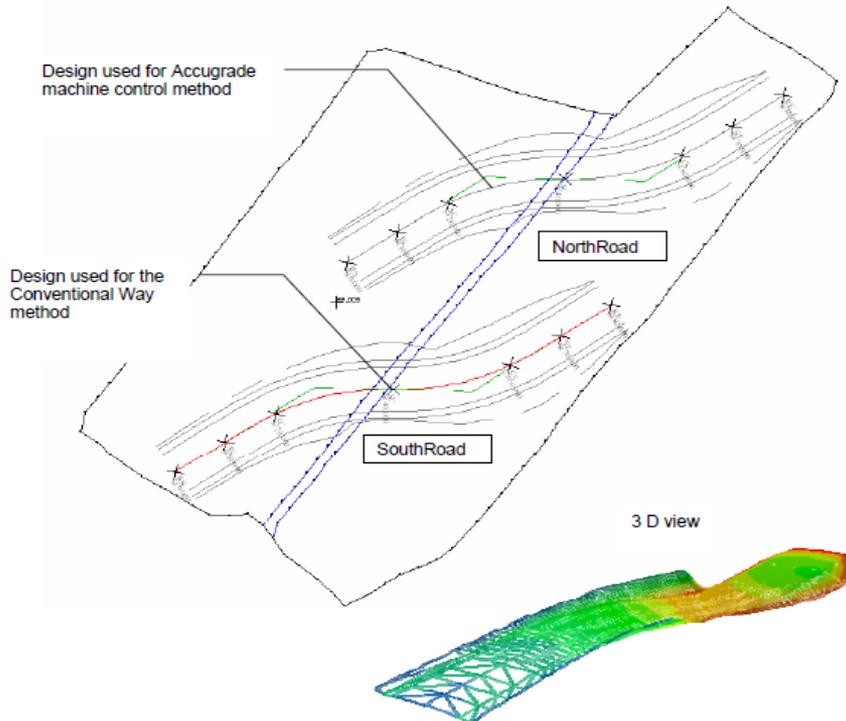


REMOTE CONTROL

OPERATE EQUIPMENT FROM SAFER LOCATIONS.

Machine Control and Guidance Provides Improved Productivity and Efficiency

Two identical roads were built, one using “conventional” methods with stakes, and the other using Machine Control and Guidance. AccuGrade Machine Controls Systems were used on the excavator and the motor grader.



Conventional Way		Using AccuGrade Machine Control systems	
	D6N		D6N with AccuGrade GPS v6.1
	330D		330D AccuGrade GPS Hex
	725 for cuts & fills 730 for cuts & fills and for base course construction 740 ejector for base course		725 for cuts & fills 730 for cuts & fills and for base course construction 740 ejector for base course
	CS 563		CS 563
	140H		140H with AccuGrade ATS
	Trimble 5800 rover kit for surveying		ATS

(ATS Trimble Advanced Tracking System)

Results using Machine Control and Guidance

Overall time to build
 Increase in overall productivity
 Fuel savings 43%

1.5 days vs. 3.5 days
 101%

Machine Control and Guidance, using technologies such as GPS and ATS, reduces surveying support, increases operational efficiency for earthmoving, decreases number of passes for fine grade work and reduces fuel consumption.



		Conventional Way	New Way AccuGrade	Productivity Gain
	Staking	07:31	00:54	6:37 hours saved
	Bulk Earthmoving	D6N 04:40	04:18	+ 9 %
		330D 02:23	01:53	+ 27 %
	Subgrade grading	D6N 03:48	01:28	+ 159 %
		330D 02:56	02:43	+ 8 %
	Base Course grading	D6N 02:24	00:53	+ 172 %
	Base course fine grading	140H 01:49	00:32	+ 241%
Total				+ 101%

Additional Head count

		Conventional Way	New Way	Gain
	Foreman	Full Time 24:32 hours	Full Time 11:50 hours	Half time
	Operators (x4)	98:08 hours	47:20 hours	Half time
	Surveyor	18:14 hours	00:54 hours	95 % of time saved
	Worker	18:14 hours	-	1 person less

Accuracy

		Conventional Way % in Tolerance of ± 3 cm	New Way % in Tolerance of ± 2 cm
	Subgrade	35%	86%
	Base course	45%	98%



		Conventional Way	New Way	Productivity Gain
	Passes	Earthmoving 259	Earthmoving 200	+ 30 %
		Sub Fine Grading 214	Sub Fine Grading 60	+ 257 %
		Base course 156	Base course 46	+ 239 %
		Total 632	Total 306	+ 107 %
		210 l	136 l	35% saved

		Earthmoving 234	Earthmoving 176	+ 32 %
		Base course 74	Base course 69	+ 7 %
		Total 308	Total 245	+ 26 %
		Earthmoving 31	Earthmoving 23	
		Base course 9	Base course 8	
		Total 40	Total 31	+ 29 %
		231 l	123 l	47% saved

	Passes	Base course 62	Base course 17	+ 265 %
		Total 22 l	7 l	68% saved

Thank you!

