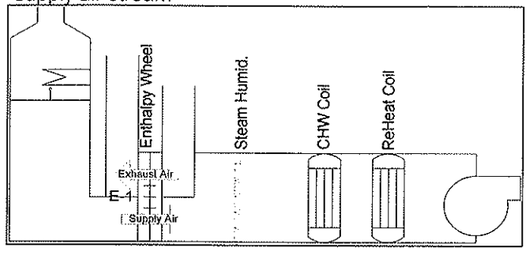
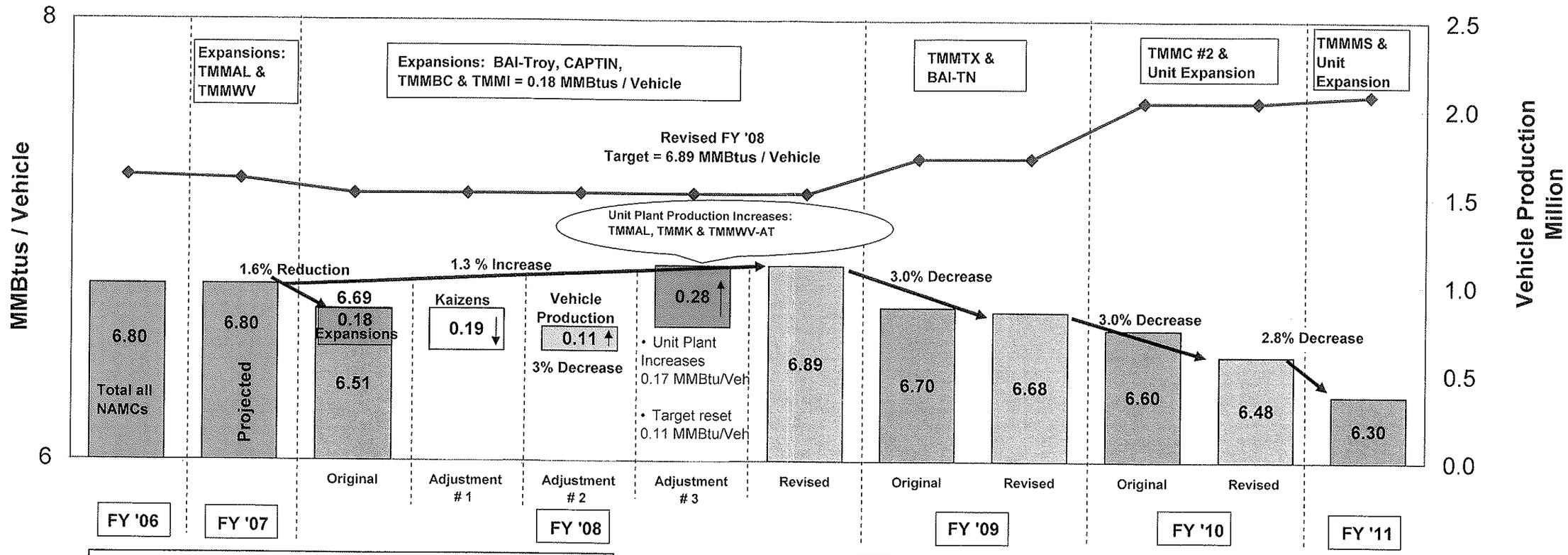
FY07 - FY11 Toyota North America Action Plan Energy Reduction Scenario Overview

Energy	New Plant Additional Energy without any ECO-Plant Kaizens	(Million MMBtu)		Bodine TN #1 ECO	0.00	CAPTIN	o	Bodine TN #2 & #3	0.09	Bodine TN #4	0.06	WV AT #5	0.05		
						TMMTX ECO Plant	0.00	CAPTIN	0.05	WV AT 3 &#4	0.15	TMMTX #2	1.14		
				WV AT #2 ECO Plant	0.05	TMMAL #2	0.08	TMMAL #3	0.11	TMMC2	1.10				
								TMMTX ECO Plant	1.14						
	(A) Total New Plants				0.05		0.08		1.39		1.31		1.19	4.02	Million MMBtu (↑)
	Potential ECO Plants Kaizens	(Million MMBtu)		Lexus	none	Bodine TN #1 ECO	-0.01	Bodine TN #2 & #3	-0.02	Bodine TN #4	-0.01	WV AT #5	-0.01		
				TMMBC Bed & Cab	-0.03	TMMTX ECO Plant	none	WV AT #3	-0.01	WV AT #4	-0.01	TMMTX #2	0.00		
				TMMAL #1 & #2	-0.01	WV AT #2 ECO Plant	-0.01	TMMAL #3	-0.01	TMMC2	-0.14				
								TMMI Weld Expansion	0.00						
	(B) Total ECO-Plant Kaizen				-0.04		-0.02		-0.04		-0.16		-0.01	-0.27	Million MMBtu (↓)
	NA Building / Utility Change	(Million MMBtu)	No Information Available				0.00	TBD	0.00	TBD	0.00	TBD	0.00		
	(C) TMMK T/C Pnt 2 Booth Elim.				-0.06										
	NUMMI Sealer Oven Elim.				-0.02		0.00								
	TMMI Sealer Oven Elim. East&W														
	Total Bldg / Utility				-0.08		0.00		0.00		0.00		0.00	-0.08	
	NA Process/Paint Mat'l Change	(Million MMBtu)	No Major Activity	TBD	0.00	TBD	0.00	TBD	0.00	TBD	0.00	TBD	0.00	TBD	
	(D) Total NA Process				0.00		0.00		0.00		0.00		0.00	0.00	Million MMBtu (↓)
	TMC Process Change / BT2000	(Million MMBtu)	No Information Available	TBD	0.00	TBD	0.00	TBD	0.00	TBD	0.00	TBD	0.00		
	(E) Total TMC Process				0.00		0.00		0.00		0.00		0.00	TBD	
	NA Pilot & Pilot Yokoten	(Million MMBtu)	SEMCO TMMK Pilot 0.00	Shut down -T/C C T2	-0.085	High Bay Lights	-0.004	Semco	0.000	Semco	0.000	High Bay Lights	-0.004		
			SEMCO TMMC -0.01	Waste Heat (2 Incin.) K	-0.014	High Efficiency Boiler K	-0.030	High Bay Lights	-0.004	High Bay Lights	-0.004	Operational	0.000		
			SEMCO TMMC-North -0.10	High Eff Boiler K -P2	-0.060	C-SEMCO (N) Ash,Anti-Ch	-0.040	C-SEMCO (S) Ash	-0.121	C-SEMCO Plastics	-0.078	C- Intelligent Lights	-0.004	-0.96	Million MMBtu (↓)
				High Bay Lights	-0.004	NUMMI Phosphate Mod	-0.01	C-Phos. IM Burner N&S	-0.004	C- Waste Heat (4 Incin) N	-0.020	Elim. Central boiler	-0.06		
				C-Oven Deck Heat Recov	-0.008	NUMMI Boiler recap heat	-0.030	Plastics Steam Ash Elim.	-0.03	Phosphate Steam Ash Elim	-0.02	TMMK Pilot	0.000		
				C-Booth Control (N,S,R)	-0.025	East Steam Ash Elim.	-0.09	TMMC Pilot	-0.003	TMMC Pilot	-0.001				
			Waste Heat K Pilot -0.03	Manual Spray Elimination	0.00	CAPTIN Pilot	-0.02	Manual Spray Elimination	-0.06	TMMK Pilot	0.00				
			Controls TMMC Pilot -0.03	West Steam Ash Elim.	0.00	BAI Pilot	-0.001	West Steam Ash Elim.	-0.09						
				West RTO Elim	0.00	TMMK Pilot	0.000	West RTO Elim	-0.03						
				NUMMI Pilot	-0.004	TMMI Pilot	-0.001								
				TMMK Pilot	0.000										
	(F) Total Pilots & Pilot Yokoten		-0.17	Operational Kaizens	-0.03	Operational Kaizens	-0.03	Operational Kaizens	-0.02	Operational Kaizens	-0.02	Operational Kaizens	-0.02		
	(G) Total NAMC Operational Kaizen	(Million MMBtu)	-0.43		-0.20		-0.22		-0.33		-0.12		-0.09		
	Total A+B+C+D+E+F+G	(Million MMBtu)	-0.59		-0.11		-0.05		-0.06		-0.18		-0.03	-0.12	Million MMBtu (↓)
					-0.26		-0.19		1.00		1.01		1.08	2.63	Million MMBtu Δ
Cost & Savings	Implementation Costs	[redacted]	SEMCO TMMK Pilot			High Bay Lights	$ [redacted]	Operational	$ [redacted]	Operational	$ [redacted]	High Bay Lights	$ [redacted]		
			SEMCO TMMC	Waste Heat (2 Incin.) K	$ [redacted]	High Efficiency Boiler K	$ [redacted]	High Bay Lights	$ [redacted]	High Bay Lights	$ [redacted]	Operational	$ [redacted]		
			SEMCO TMMC-North	High Eff Boiler K -P2	$ [redacted]	C-SEMCO (N) Ash,Anti-Ch	$ [redacted]	C-SEMCO (S) Ash	$ [redacted]	C-SEMCO Plastics	$ [redacted]	C- Intelligent Lights	$ [redacted]		
			Waste Heat K Pilot	High Bay Lights	$ [redacted]	NUMMI Phosphate Mod	$ [redacted]	C-Phos. IM Burner N&S	$ [redacted]	C- Waste Heat (4 Incin) N	$ [redacted]	Elim. Central boiler	$ [redacted]		
			Controls TMMC Pilot	C-Oven Deck Heat Recov	$ [redacted]	NUMMI Boiler recap heat	$ [redacted]	Plastics Steam Ash Elim.	$ [redacted]	Phosphate Steam Ash Elim	$ [redacted]	TMMTX #2 Semco	$ [redacted]		
				C-Booth Control (N,S,R)	$ [redacted]	East Steam Ash Elim.	$ [redacted]	TMMC Pilot	$ [redacted]	TMMC2 Semco	$ [redacted]	TMMK Pilot	$ [redacted]		
				Manual Spray Elimination	$ [redacted]	CAPTIN Pilot	$ [redacted]	Manual Spray Elimination	$ [redacted]	TMMC Pilot	$ [redacted]				
				West Steam Ash Elim.	$ [redacted]	BAI Pilot	$ [redacted]	West Steam Ash Elim	$ [redacted]						
				West RTO Elim	$ [redacted]	TMMK Pilot	$ [redacted]	West RTO Elim	$ [redacted]						
				NUMMI Pilot	$ [redacted]	TMMI Pilot	$ [redacted]								
				TMMK Pilot	$ [redacted]										
	(H) Total			Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]		
	$ Savings	[redacted]	SEMCO TMMK Pilot	$		$		$		$		$			
			SEMCO TMMC			High Bay Lights	$ [redacted]	Operational	$ [redacted]	Operational	$ [redacted]	High Bay Lights	$ [redacted]		
			SEMCO TMMC-North	Waste Heat (2 Incin.) K	$ [redacted]	High Efficiency Boiler K	$ [redacted]	High Bay Lights	$ [redacted]	High Bay Lights	$ [redacted]	Operational	$ [redacted]		
			Waste Heat K Pilot	High Eff Boiler K -P2	$ [redacted]	C-SEMCO (N) Ash,Anti-Ch	$ [redacted]	C-SEMCO (S) Ash	$ [redacted]	C-SEMCO Plastics	$ [redacted]	C- Intelligent Lights	$ [redacted]		
			Controls TMMC Pilot	High Bay Lights	$ [redacted]	NUMMI Phosphate Mod	$ [redacted]	C-Phos. IM Burner N&S	$ [redacted]	C- Waste Heat (4 Incin) N	$ [redacted]	Elim. Central boiler	$ [redacted]		
				C-Oven Deck Heat Recov	$ [redacted]	NUMMI Boiler recap heat	$ [redacted]	Plastics Steam Ash Elim.	$ [redacted]	Phosphate Steam Ash Elim	$ [redacted]	TMMTX #2 Semco	$ [redacted]		
				C-Booth Control (N,S,R)	$ [redacted]	NUMMI Elim. Sealer Oven	$ [redacted]	TMMC Pilot	$ [redacted]	TMMC2 Semco	$ [redacted]	TMMK Pilot	$ [redacted]		
				Manual Spray Elimination	$ [redacted]	East Steam Ash Elim.	$ [redacted]	Manual Spray Elimination	$ [redacted]	TMMC Pilot	$ [redacted]				
				West Steam Ash Elim.	$ [redacted]	CAPTIN Pilot	$ [redacted]	West Steam Ash Elim.	$ [redacted]						
				West RTO Elim	$ [redacted]	BAI Pilot	$ [redacted]	West RTO Elim	$ [redacted]						
				NUMMI Pilot	$ [redacted]	TMMK Pilot	$ [redacted]								
				TMMK Pilot	$ [redacted]	TMMI Pilot	$ [redacted]								
	(I) Total			Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]	Operational Kaizens	$ [redacted]		$ [redacted]		
			$ [redacted]	$		$		$		$		$			
	Payback (H/I)	(Years)	7.09		1.96		2.73		3.09		4.39		1.96	2.87	Years
Energy/CO2 End Result	Energy Usage	(Million MMBtu)	10.37		10.11		9.92		10.92		11.93		13.00		
	Production Projection	(Million Vehicles)	1.62		1.49		1.51		1.88		2.04		2.08000		
	Energy/Veh	(MMBtu/Vehicle)	6.40		6.77		6.56		5.80		5.85		**6.25**		
	CO2	(Million MT)	1.28		1.29		1.44		1.46		1.51		1.65		
	CO2 / Vehicle	(MT/Vehicle)	0.79		0.87		0.95		0.77		0.74		**0.79**		

Project	Description	Location	Status	Results		Implementation Cost	Payback	Yokoten				
				MMBTU	$			FY07	FY08	FY09	FY10	FY11
High Bay Fluorescent	Replace Metal Halide High Intensity Discharge lamps with high bay fluorescent fixtures.	TMMK (42 fixtures), TMMI (12 fixtures), NUMMI (12 fixtures)	Complete	0.00041	$ [redacted]	$ [redacted]	3.71					
SEMCO Enthalpy Wheels	Transfer 75% of enthalpy from exhaust air stream to supply air stream	TMMK2	Complete	25,700	$ [redacted]	$ [redacted]	4.90	K2 P&A1B	K2 A3B3	A4B4	A2	
Steam Generation	Uses a closed circulating hot water loop to capture heat from exhaust stacks and convert into steam.	TMMK	Complete	134,000	$ [redacted]	$ [redacted]	2.80	TMMC	BAI Troy	CAPTIN	BAI StL	
Paint Booth Controls Upgrac	Improve paint booth energy efficiency by utilizing improved controls and equipment to minimize energy use required to reach paint "window" defined by the range of temperatures and humidity conditions used Toyota paint requirements.	TMMC pilot	FY06	24,250	$ [redacted]	$ [redacted]	2.86	TMMK2	TMMC N	TMMI W	TMMI E	
Immersion Burner	Replace existing steam heat exchangers in phosphate and ED baths with immersion burners. Based on Honda project	TMMI E pilot	On Hold	8,700	$ [redacted]	$ [redacted]	6.16					
HVAC burner improvement	Convert indirect fired units in paint shops to direct fired units	TMMK Pilot	FY08	1,700	$ [redacted]	$ [redacted]	2.5					
Condensing Stack Economi:	Recover heat from boiler stacks and use to preheat water for steam generation.	TMMI Pilot	FY07	35,000	$ [redacted]	$ [redacted]	1.22					



Modified FY '11 Energy Action Plan
Overall North America Assembly and Unit Plants



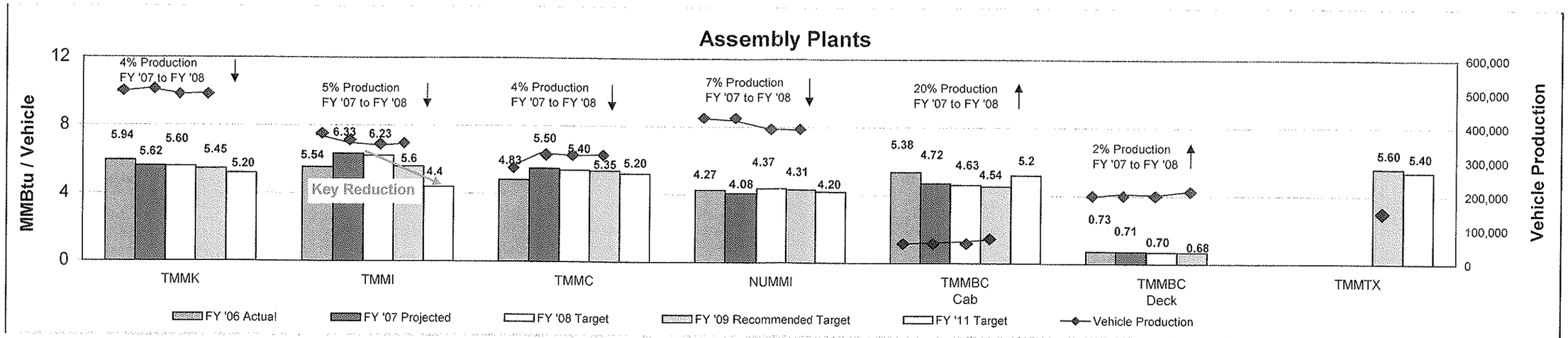
Legend	
	Actual
	Original Targets
	Revised Targets

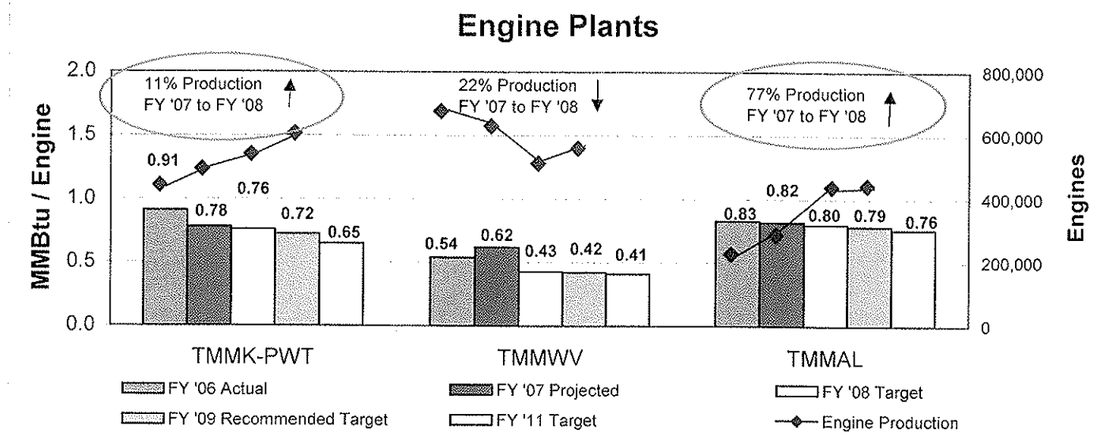
Legend	FY '08	+ / -	FY '08 Target Revision MMBtus / Vehicle
	Original FY '08 Target		6.69
	Expansions: CAPTIN, TMMBC, BAI-Troy & TMMI		
	Adjustment #1 Kaizens Completed	-	0.19
	Adjustment #2 Production Decrease = 3% - Original 1.56 M, revised 1.52 M	+	0.11
	Adjustment #3 Production increases @ TMMAL, TMMWV AT & TMMK PWT Target resets	+	0.28
	FY '08 Revised Target		6.89

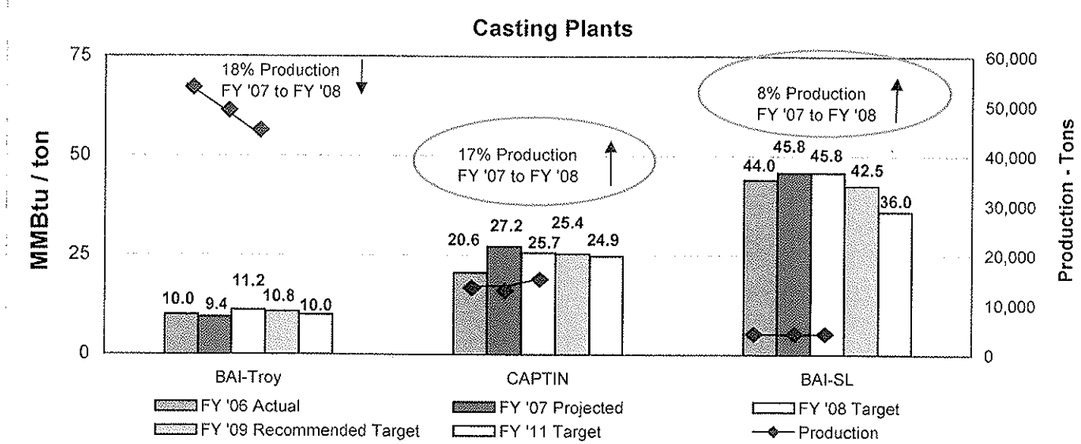
Next Steps - Kaizen Activities:

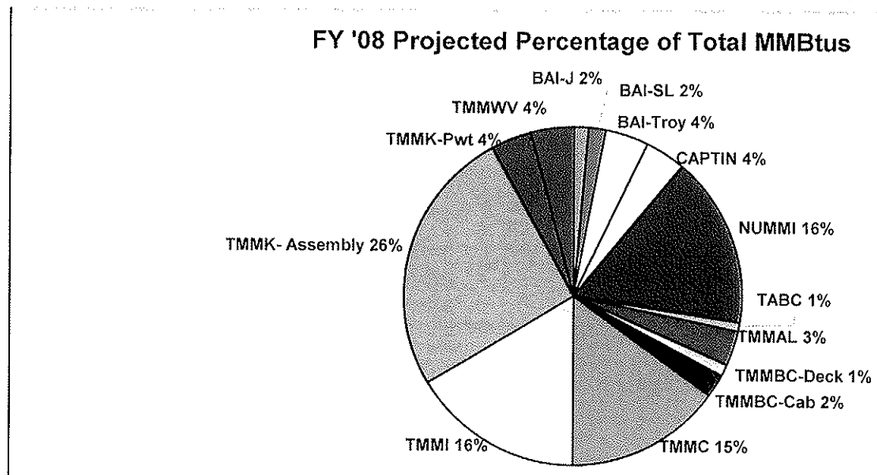
1. Steam elimination in Paint and Plastics air supply houses
2. Paint heat recovery
3. Replace direct steam injection with immersion burners in Bodyweld phosphate ED
4. Eliminate central steam system / replace with package boilers serving Paint and Plastics
5. High-bay fluorescent lighting replacement program

NAMCs Energy Use and Production Trends









Summary:

- FY '08 targets for four NAMCs are above recommended targets for their NAMC, thus, impacting overall energy target
  Breakdown of increase is as follows:
  BAI-SL = 5%
  CAPTIN = 1%
  NUMMI = 12%
  TMMI = 82%
- Production decrease of 3% impacting overall FY '08 energy target
  Decrease is based on FY '08 production projection during development of FY '11 Action Plan
  FY '08 projected production = 1.56 Million vehicles
  FY '08 revised production = 1.52 Million vehicles
- Engine plant's production increase of 8% will have significant impact on overall energy target
- TMMI target very aggressive and critical for FY '11 Plan