BIOFUEL USAGE IN TÜPRAŞ AND TURKEY

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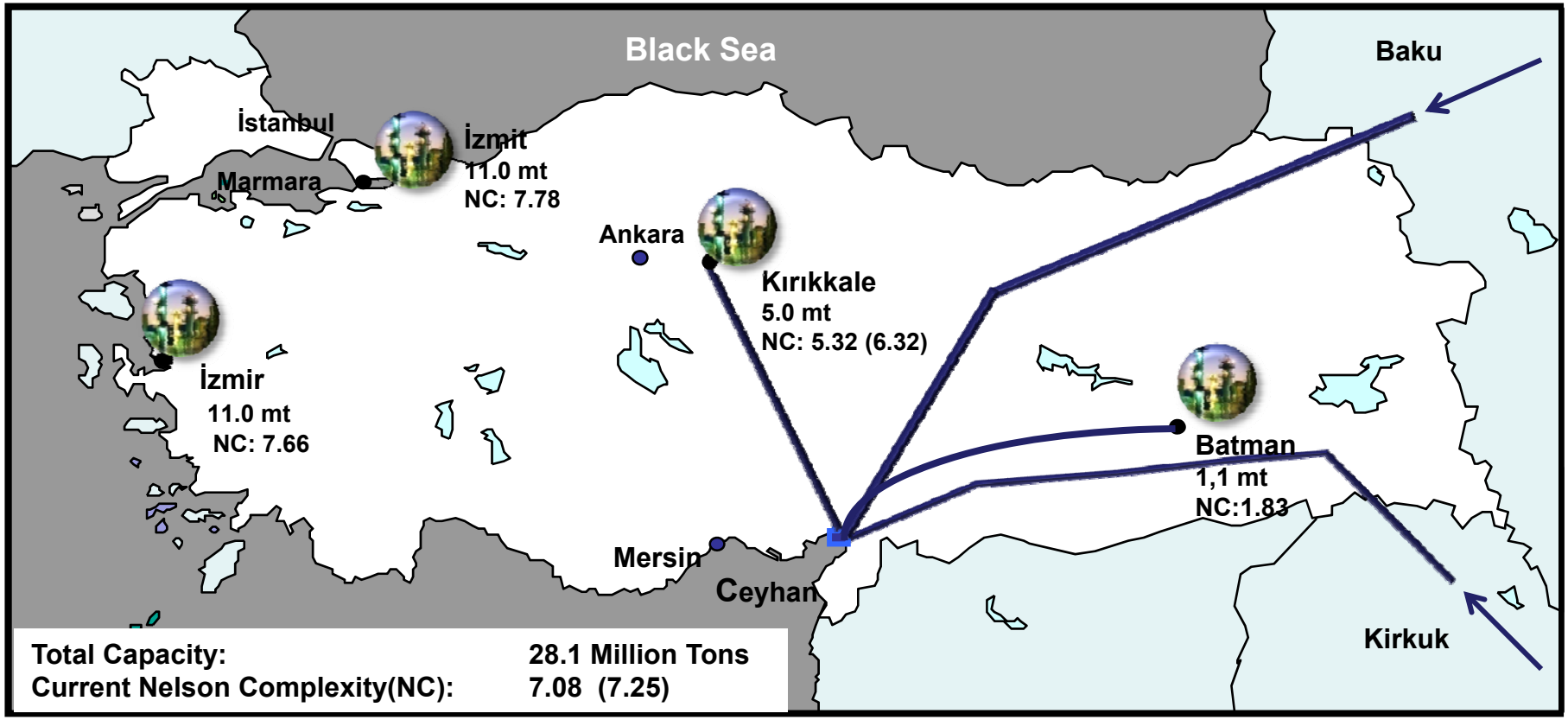
OUTLINE

- Tüpraş Assets
- Fuel and Biofuel Standards
- Fuel Sales and Biofuel Requirement
- Biofuel Blending Actions in Tüpraş Refineries
- Biofuel issues

TÜPRAŞ Assets



Petro-chemicals

İzmit

100% Share

Capacity: 50 kt

Product: Carbon Black

Shipping

Ditaş

79.98% Share

165 kDWT Crude Tanker

15 kDWT Product Tanker

Retailing

Opet

40% Share

1,280 Retail Sites

850 kM3 Storage

Trading, Lubricants & Bunkering activities

TÜPRAŞ GASOLINE AND DIESEL SALES,IMPORTS,EXPORTS (Ton)

PRODUCT	DOMESTIC SALES	EXPORT	IMPORT
Gasoline	1.900.000	2.400.000	-
Diesel	9.000.000	471.000	2.700.000

FUEL AND BIOFUEL STANDARDS

Diesel Standard: TS 3082 EN 590

S5

Property	Specification
Cetane number, min	51
Cetane index, min	46
Sulphur, ppm, max	**50-1000-7000**
Polyaromatics, wt%, max	11
Density @ 15°C (60°F), kg/m3, min-max	820-845
Viscosity @ 40°C, cSt, min-max	2-4,5
E250, vol%, max	65
E350, vol%, min	85
Flash Point, °C, min	55
Carbon residue 10% (CCR), wt%, max	0,3
Cold Filter Plugging Point (CFPP), °C, max	-15°C (w) / +5°C (s)
Water, vol%, max	0,02
Ash, wt%, max	0,01
Total contamination, ppm, max	24
Lubricity, HFRR wear scar diam @ 60°C, max	460
Copper corr., 3hr @ 50°C, merit (class), max	class 1
Oxidation stability, mg/100ml, max	2,5
FAME content, vol%, max	**5**

FUEL AND BIOFUEL STANDARDS

Biodiesel Standard: TS EN 14214

Property	Specification
Cetane number, min	51
Ester content (concentration), wt%, min	96,5
Sulphur, ppm, max	10
Density @ 15°C (60°F), kg/m3, min-max	860-900
Viscosity @ 40°C, cSt, min-max	3,5-5
Flash Point, °C, min	120
Carbon residue 10% (CCR), wt%, max	3
Water, vol%, mg/kg	500
Sulfated Ash, wt%, max	0,02
Total contamination, ppm, max	24
Acid value, mg KOH/g, max	0,5
Methanol, vol%, max	0,2
Glycerol	
Free, wt%, max	0,02
Total, wt%, max	0,25

FUEL AND BIOFUEL STANDARDS

Gasoline Standard: TS EN 228

Property	Specification
RON- MON, min	95-85
Sulphur, ppm, max	50
Lead, g/l, max	0,005
Benzene, vol%, max	1
Aromatics, vol%, max	35
Olefins, vol%, max	18
RVP @ 37.8°C, kPa, min-max	45-60 (s) / 60-90 (w)
VLI, (VLI=10RVP+7 E70), calculated, max	1150
Density @ 15°C (60°F), kg/m3, min-max	720-775
Oxygen, wt%, max	**2,7**
Oxidation stability (Induction period), minutes, min	360
Existent gum (solvent washed), mg/100ml, max	5
Methanol, vol%, max	3
Ethanol, vol%, max	**5**
Iso-propyl alcohol, vol%, max	10
Iso-butyl alcohol, vol%, max	10
Tert-butyl alcohol, vol%, max	7
Ethers (5 or more C atoms), vol%, max	15
Others, vol%, max	10

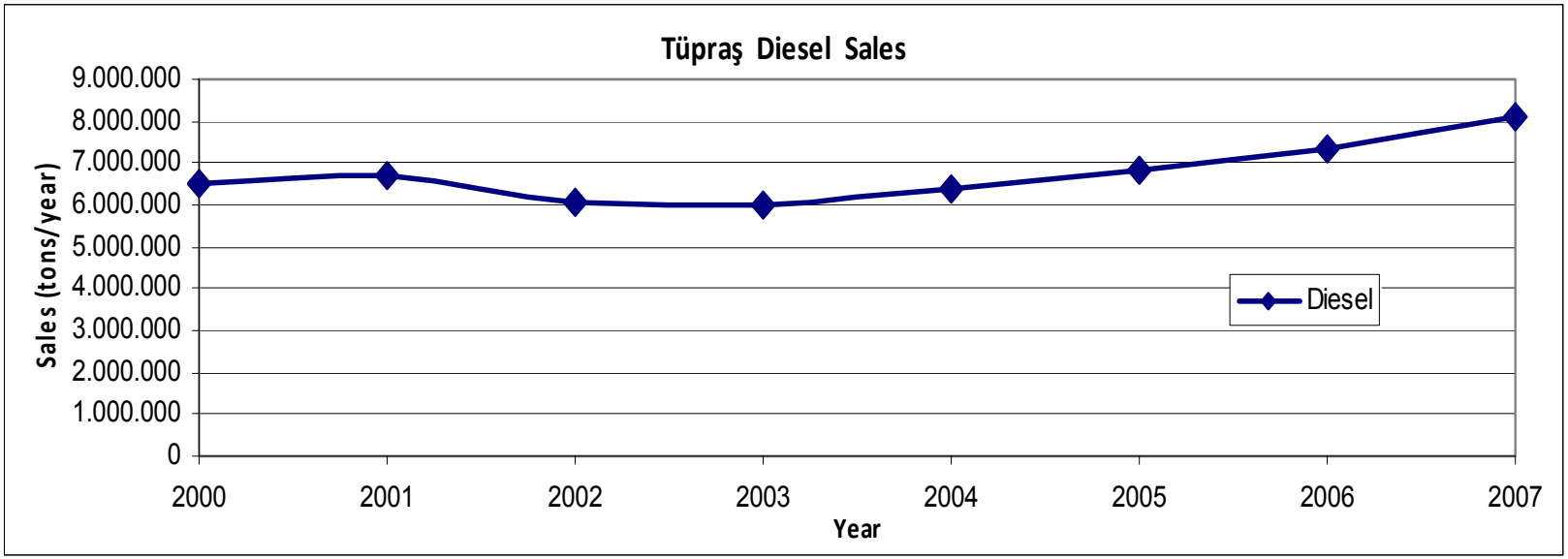
FUEL AND BIOFUEL STANDARDS

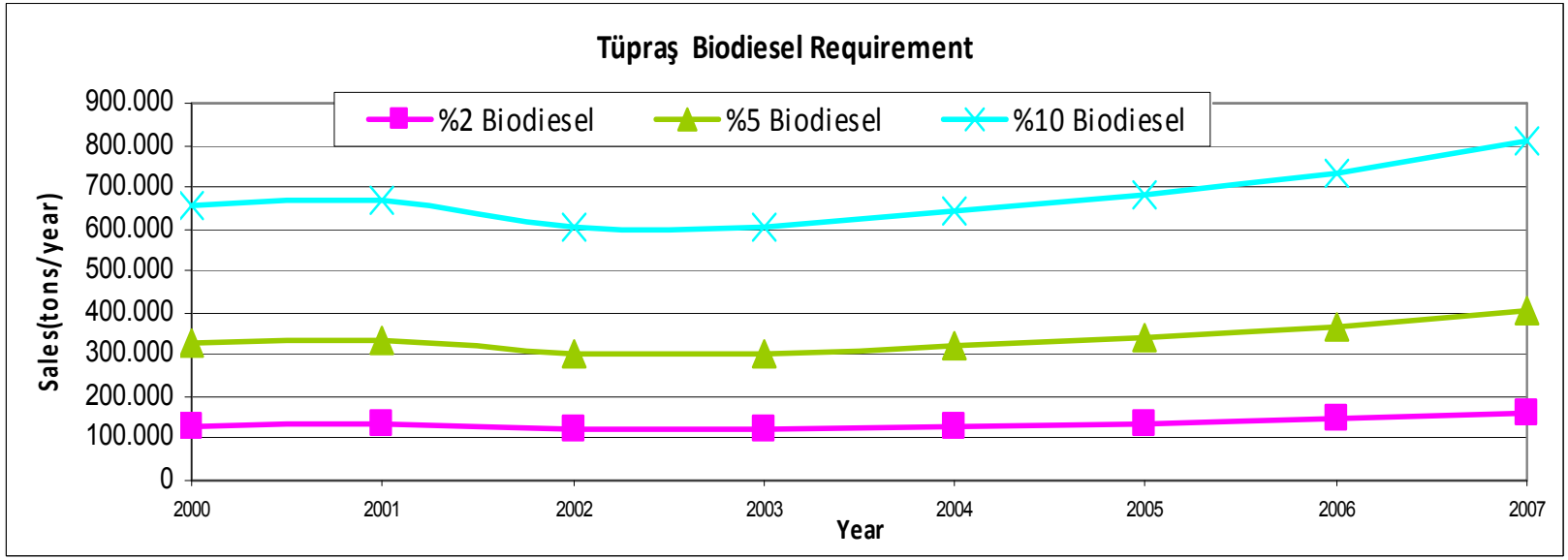
Bioethanol (Undenatured)Standard: EN 15376(not issued yet)

Property	Specification
Ethanol content + higher saturated alcohols, % (m/m), min	98,7
Higher saturated (C3-C5) mono alcohols content, % (m/m), max	2.0
Methanol content, % (m/m), max	1.0
Water content, % (m/m), max	0.300
Inorganic chloride content, mg/l, max	20.0
Copper content, mg/kg, max	0.100
Total acidity (expressed as acetic acid), % (m/m), max	0.007
Appearance	Clear and bright
Phosphorus content, mg/l, max	0.50
Involatile material content, mg/100 ml, max	10
Sulphur content, mg/kg, max	10

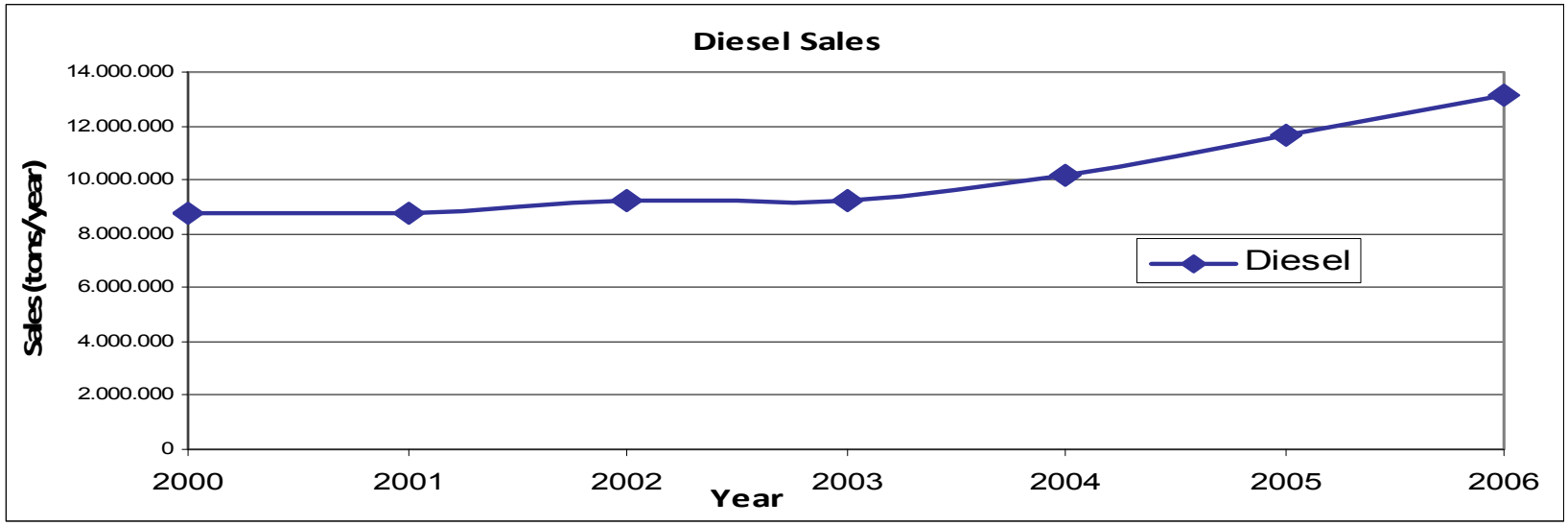
A list of selected non-harmful denaturants is given in the standard: automotive gasoline EN 228, ETBE, MTBE, TBA, 2-methyl-1-propanol (isobutanol) and 2-propanol (isopropanol).

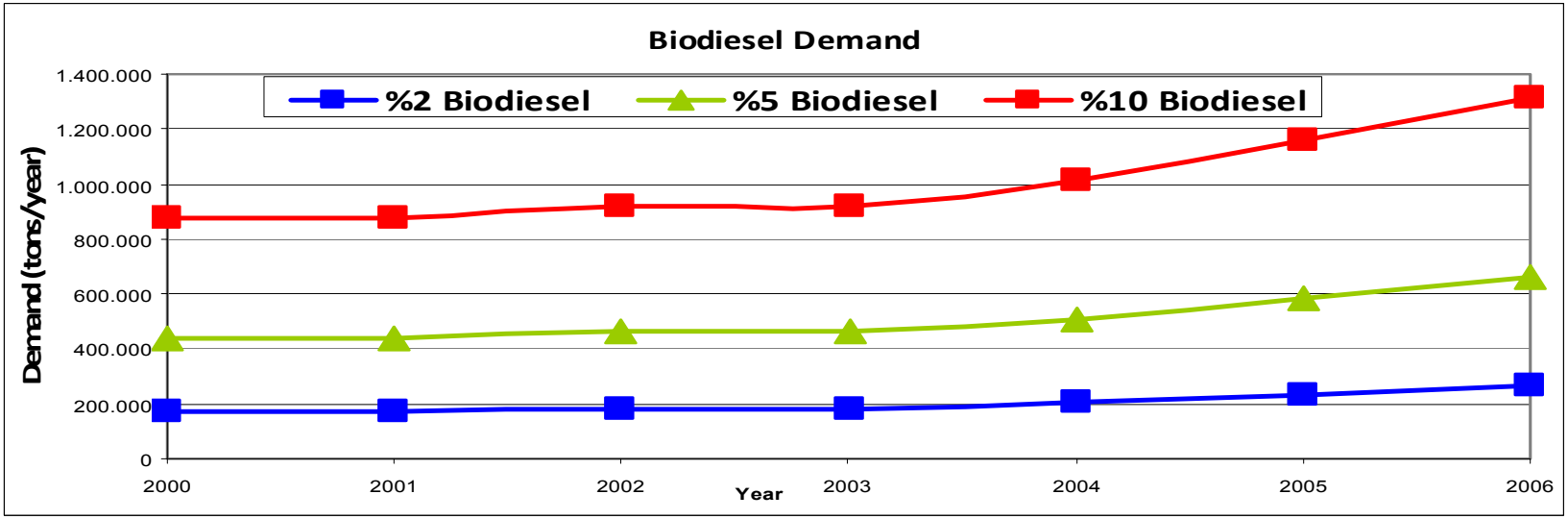
TÜPRAŞ DIESEL SALES AND BIODIESEL REQUIREMENT





TURKEY DIESEL SALES AND BIODIESEL REQUIREMENT





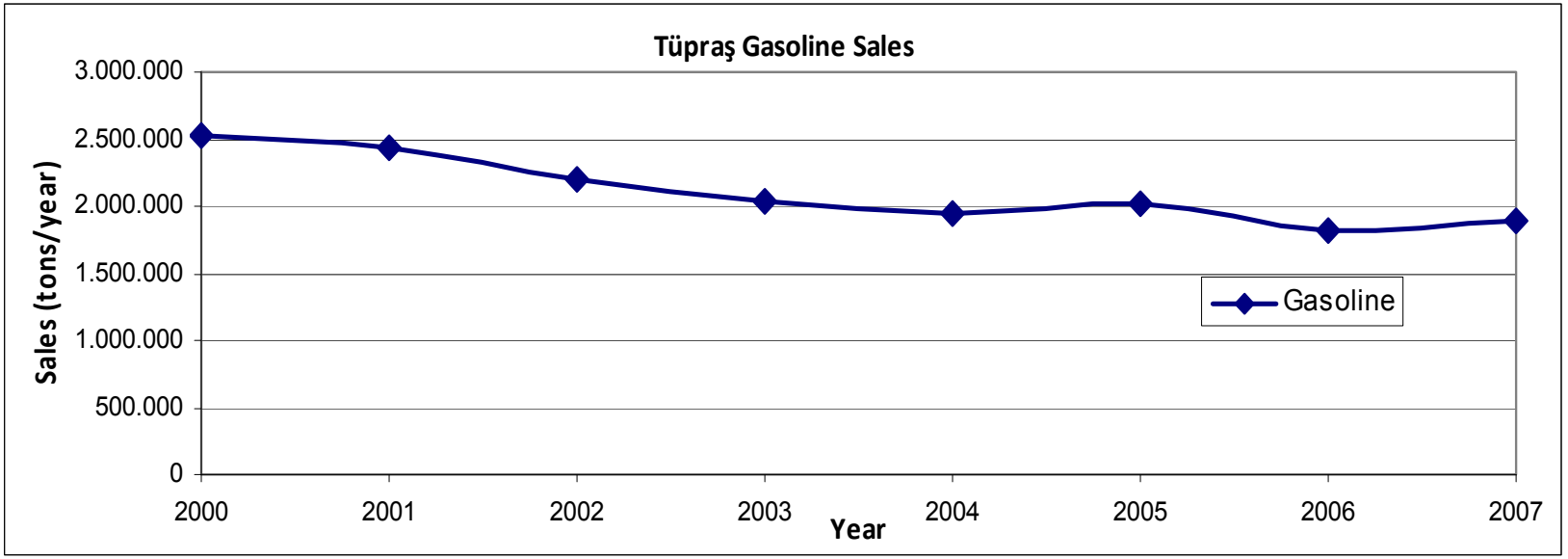
TÜPRAŞ DIESEL SALES AND BIODIESEL REQUIREMENT

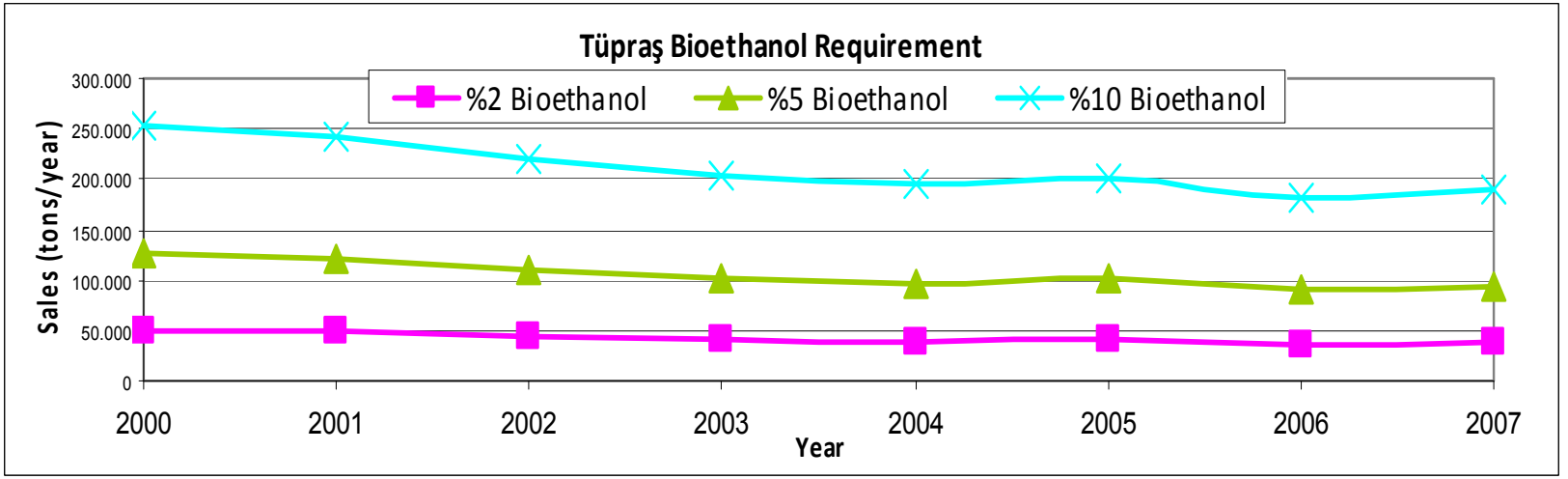
Years	Diesel Sales (tons/year)	Biodiesel Requirement (tons/year)		
		2%	5%	10%
2005	6.822.800	136.456	341.140	682.280
2006	7.314.229	146.285	365.711	731.423
2007	8.130.506	162.610	406.525	813.051

TURKEY DIESEL SALES AND BIODIESEL REQUIREMENT

Years	Diesel Sales (tons/year)	Biodiesel Requirement (tons/year)		
		2%	5%	10%
2004	10.140.910	202.818	507.046	1.014.091
2005	11.616.251	232.325	580.813	1.161.625
2006	13.164.318	263.286	658.216	1.316.432

TÜPRAŞ GASOLINE SALES AND BIOETHANOL REQUIREMENT





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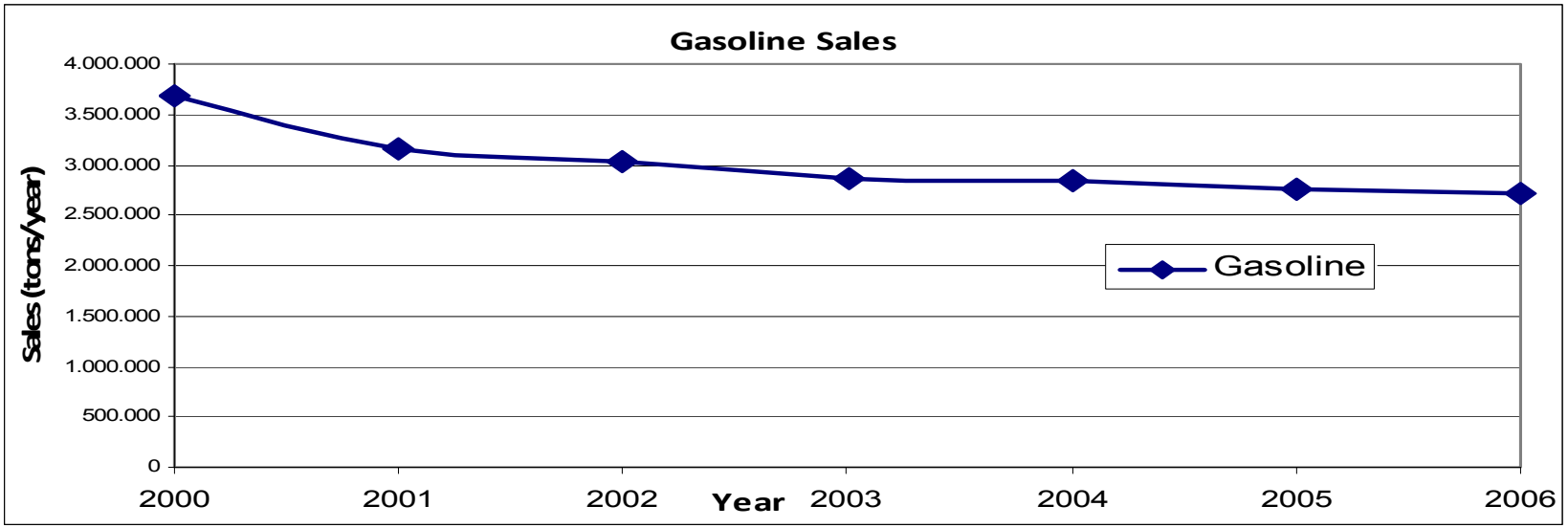

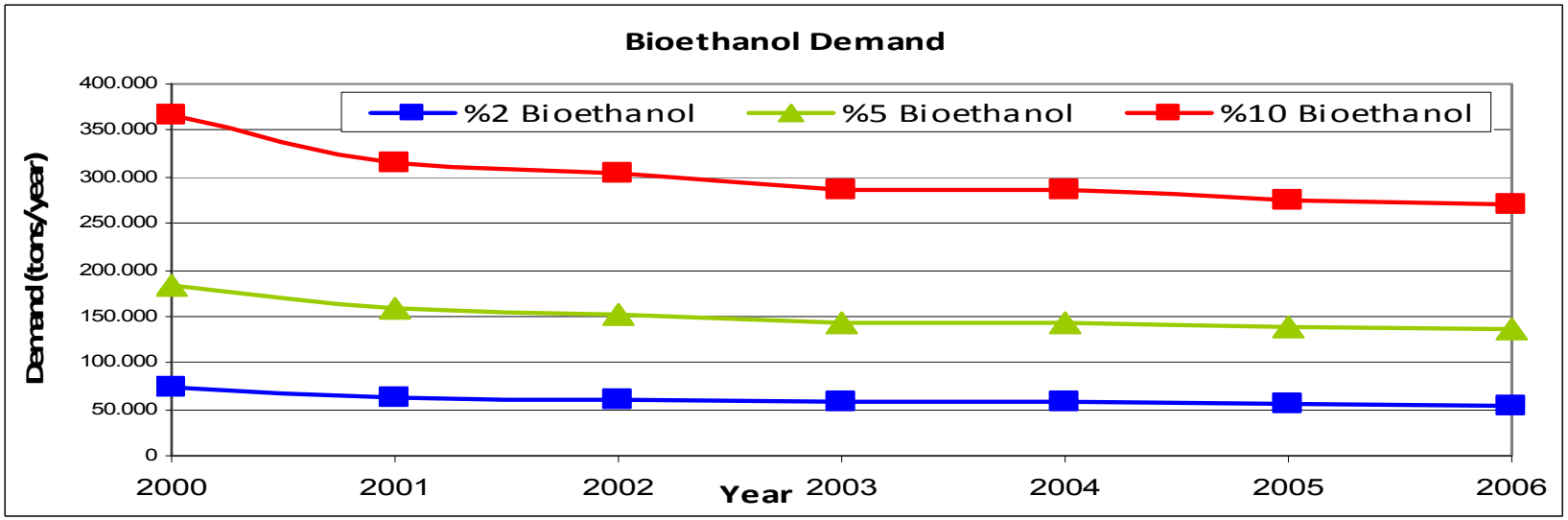

TÜPRAŞ GASOLINE SALES AND BIOETHANOL REQUIREMENT

Years	Gasoline Sales (tons/year)	Bioethanol Requirement (tons/year)		
		2%	5%	10%
2005	2.010.015	40.200	100.501	201.002
2006	1.811.381	36.228	90.569	181.138
2007	1.896.603	37.932	94.830	189.660

TURKEY GASOLINE SALES AND BIOETHANOL REQUIREMENT

Tüpraş

Years	Gasoline Sales (tons/year)	Bioethanol Requirement (tons/year)		
		2%	5%	10%
2004	2.849.393	56.988	142.470	284.939
2005	2.752.293	55.046	137.615	275.229
2006	2.714.875	54.298	135.744	271.488

BIOFUEL BLENDING ACTIONS IN TÜPRAŞ REFINERIES

- Production

-Tüpraş Refineries is planning to purchase the biofuel from other suppliers
- Tüpraş does not have investment plan to produce biofuels

- Storage & Blending

-Tüpraş Refineries are ready to blend biodiesel and bioethanol

-Storage tanks, unloading systems are installed

BIOFUEL ISSUES

- General:
  - Existing 2 % Special Consumption Tax incentive does not give any benefit to Tüpraş
- Biodiesel:
  - Cold flow properties may create problem.
  - Storage stability due to unsaturated hydrocarbons
- Bioethanol:
  - High vapor pressure
  - Water solubility

Summary

- Tüpraş as a refining company is ready to blend biofuels up to the level specified in gasoline and diesel standards

- Tüpraş can only blend the products meeting Biodiesel and Bioethanol standards

- The tax incentives must not destroy existing free petroleum market system

- Turkey is short in Diesel, Biodiesel can help to improve imbalance

- Turkey is long in Gasoline, Tüpraş may get benefit to meet 35% Aromatic specification by blending bioethanol

Thank you for your attention