

Status of Vision Goals: Biomass R&D Technical Advisory Committee

Vision for Bioenergy & Biobased Products in the United States:

Goals Review and Narrative

During the March 17th, 2005 quarterly meeting, the Biomass R&D Technical Advisory Committee discussed a re-evaluation of its *Vision* goals for U.S. production of biofuels, biopower, and bioproducts. In response to this request, this document presents the current status of the Committee's *Vision* goals, 2004 production figures, and an outline of factors impacting 2004 biomass production.

Biofuels

Demand for all transportation fuels (including petroleum) is predicted to increase from 27.5 quadrillion Btus in 2004 to 31.2 quadrillion Btus in 2010.¹

In 2004, bio-based fuels constituted 1.08% of total transportation energy consumption in the U.S., or 0.30 quads. The Technical Advisory Committee's *Vision* goals state that by 2010, biofuels will account for either 4% of total transportation fuels production, or 1.3 quadrillion Btus. To achieve the 2010 *Vision* goal, biofuels demand will need to increase about 5% annually, or 0.195 quads per year from 2004 through 2010. (See Figure 1 and Table 2.) This remains an aggressive goal. Consumers may see future price decreases due to practical application of current cellulosic ethanol research and development.²

The increase in demand for alcohol-based transport fuels resulted, in part, from the ban of methyl tertiary butyl ether (MTBE) in some states.³ Projected sustained growth can be tied to continuation of the Federal Ethanol subsidy through at least 2008, pending parallel development of cellulosic ethanol, and cost amelioration resulting from such technological advances.⁴

Biodiesel's increased use has been highlighted as recently as May 2005, with a Presidential visit to a Virginia soy biodiesel plant. Biodiesel enjoys the highest rate of growth of all American alternative fuels. This has been helped by promotion of fleet use (without necessitating significant alterations to vehicles), and 2004 preparations for a biodiesel-specific tax incentive.⁵

¹ Energy Information Administration, *Annual Energy Outlook 2005* "Alternative Fuels Make Up 2.2 Percent of Light-Duty Vehicle Fuel Use in 2025" Figure 56 (Energy Information Administration: January 2005). <<http://www.eia.doe.gov/oiaf/aeo/demand.html>>

² DiPardo, Joseph. *Outlook for Biomass Production and Demand* "Background", paragraph 11. (Energy Information Administration: July, 2002) <<http://www.eia.doe.gov/oiaf/analysispaper/biomass.html>>

³ Ibid. "Background", paragraph 7.

⁴ Ibid. "Background" paragraph 10.

⁵ "President's Call for Greater Use of Soy Biodiesel Use in Energy Plan", *Southwest Nebraska News*, May 18, 2005 <http://www.ebb-eu.org/pressdl/Bush_visit_biodiesel_plant.htm> (Speech transcript at <<http://www.whitehouse.gov/news/releases/2005/05/20050516.html>>)

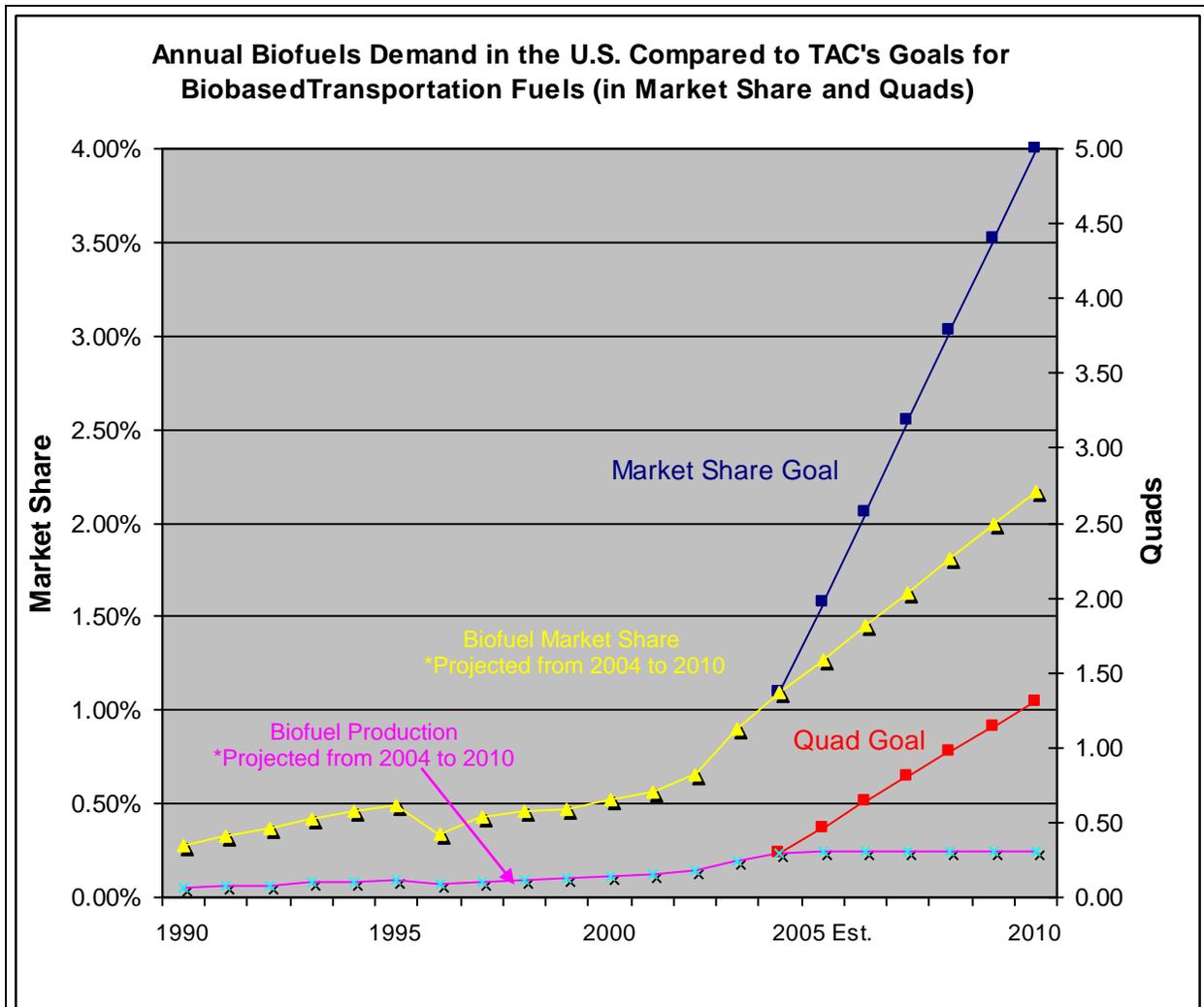


Figure 1.⁶

Vision Goal - % Market Share

Actual and Projected Average Production* - % Market Share

Biopower

Vision Goal - Quads

2004 levels of biomass power generation stood at 2.96% of total market share and 2.13 quadrillion Btus. 2010 *Vision* goals call for biomass to account for either a 4% market share, or 3.3 quads, of all power generation. (See Figure 2 and Table 3.)

Power generated from biomass sources decreased slightly in 2004.⁸ There are several potential factors for consideration in the 2004 decrease. States with renewable energy regulations have not added, among other types, biomass generation capacity, as quickly as has been forecasted.⁹

⁶ "Biofuels" consisting of 99% Alcohol Fuels, 1 % Biodiesel, on average, annually.

*Last three years' biofuels production growth averaged, then projected through 2010.

⁷ Department of Energy, 2004 *Biomass TAC Tracking Data*, "Goal Summary" (Department of Energy: June 2005)

⁸ *Ibid.*, "Biopower"

In addition, the ability of biopower to become competitive in the generation market is dependent upon economies of scale, combined with basic biopower fuel material costs. Economic growth determines electricity costs and demand to some extent. Higher electricity demand would create a need for new plants, to include biopower technology.¹⁰

Industrial power generation used less wood, and more waste products, in biopower production, while electricity producers did the reverse. Total power generation, including non-biomass resources, grew 1.53%.¹¹

⁹ Energy Information Administration, *Annual Energy Outlook 2005*. “State Programs Will Continue To Support Renewable Energy Use”, paragraph 3. (Energy Information Administration: January 2005).
<<http://www.eia.doe.gov/oiaf/aeo/electricity.html>>

¹⁰ Energy Information Administration, *Annual Energy Outlook 2005* “Rapid Economic Growth Would Boost New Coal and Renewable Capacity” paragraph 2. (Energy Information Administration: January 2005).
<<http://www.eia.doe.gov/oiaf/aeo/electricity.html>>

¹¹ Department of Energy, *2004 Biomass TAC TrackingData.*, “Biopower” (Department of Energy: June 2005)

*Last three years’ biopower production growth averaged, then projected through 2010.

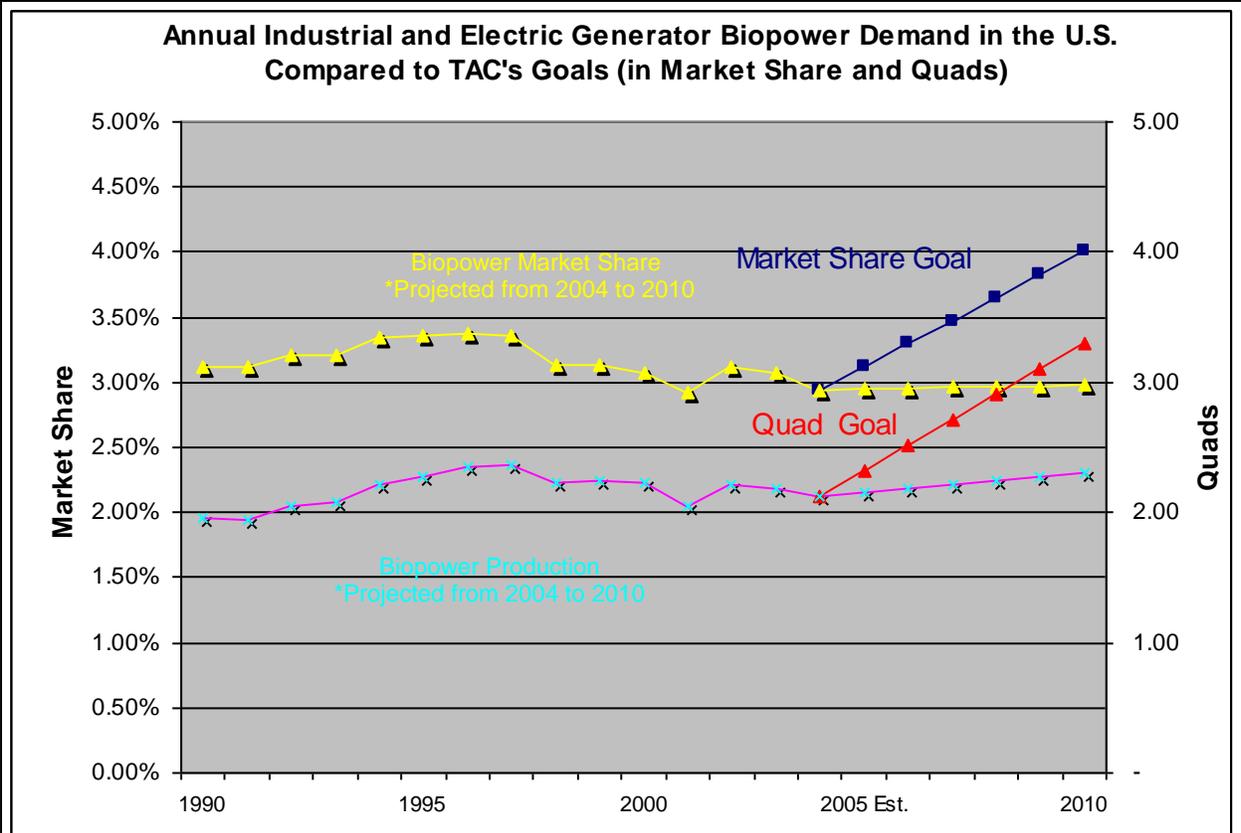


Figure 2. Vision Goal - % Market Share
 Actual and Projected Average Production* - % Market Share
 Vision Goal - Quadrillion Btus
 Actual and Projected Average Production* - Quads

Bioproducts¹²

Vision goals establish a 5% of total products, or 12,453 million pounds, baseline biobased production in 2001. The 2010 goal is 12%, or an estimated 29,829.60 million pounds. This requires an increase in production of 23%, or 2,905 million pounds, annually of biobased products.¹³ (See Table 1.) The most recent data indicated 12,454 million pounds of biobased products, or 4.7% of market share, were manufactured with biobased products (including organic acids, industrial-use ethanol, starch, sorbitol, glycerol/glycerine, alkyd resins, soy-based products, specialty oils, forest chemicals, and cellulose polymers).¹⁴

Data on biobased products production during 2004 is scarce. Research with National Laboratory representatives, the New Uses Council, the USDA, the National Soybean Board, Federal Procurement offices, and manufacturers' associations failed to obtain significant data regarding 2004 bioproducts production levels.

Tracking of federal spending on biobased products may become more standardized in the coming years, as DOE and USDA's offices of administration are working to develop a system to track federal procurement of biobased products. The USDA Federal Biobased Products Procurement Program, established in response to the 2002 Farm Bill, may facilitate tracking of biobased manufacturing.

Bioproducts		
YEAR	% Market Share	Million Pounds
2001 - baseline	4.7%	12,429
<i>Vision Goals</i>		
2010 - goal	12%	29,829.60
2020 - goal	18%	44,744.40
2030 - goal	25%	62,145.00

Table 1. Bioproducts: Annual Consumption and Technical Advisory Committee *Vision* goals

¹² "...resources such as crops, trees, and agricultural, industrial, municipal, and forestry wastes... [to] provide industrial and consumer products for everyday use" Biomass R&D Technical Advisory Committee. *Vision for Bioenergy and Biobased Products in the United States*, p. 1 (October 2002)

¹³ Department of Energy, *2004 Biomass TAC Tracking Data* "Goal Summary" (Department of Energy: June 2005)

¹⁴ Ibid., "Bioproducts"

Biofuels		
YEAR	Actual Production	
	% Market Share	Quadrillion Btus
1990	0.28%	0.06
1991	0.33%	0.07
1992	0.37%	0.08
1993	0.42%	0.10
1994	0.46%	0.11
1995	0.49%	0.12
1996	0.34%	0.08
1997	0.43%	0.11
1998	0.46%	0.12
1999	0.47%	0.12
2000	0.52%	0.14
2001	0.56%	0.15
2002	0.66%	0.18
2003	0.90%	0.24
2004	1.08%	0.30
Vision Goals		
2010	4.00%	1.30
2020	10.00%	4.00
2030	20.00%	9.50

Table 2. Biofuels: Annual Consumption and Technical Advisory Committee *Vision* goals ¹⁵

¹⁵ “Biofuels” consisting of 99% Alcohol Fuels, 1% Biodiesel, on average, annually.

Biopower						
YEAR	Actual Production					
	% Market Share	Quadrillion Btus	Industrial (Billion Btus)		Electric Utilities & Non-Utilities (Bbtus)	
			Wood	Waste	Wood	Waste
1990	3.12%	1.95	1,441,911	192,323	128,516	187,991
1991	3.12%	1.95	1,409,847	184,674	125,795	228,556
1992	3.21%	2.04	1,461,223	178,513	140,221	262,236
1993	3.21%	2.08	1,483,167	181,158	149,832	264,787
1994	3.35%	2.21	1,579,732	199,246	152,335	281,554
1995	3.36%	2.27	1,652,078	195,025	125,412	296,252
1996	3.37%	2.35	1,683,499	223,548	137,860	300,413
1997	3.36%	2.36	1,730,613	184,014	136,992	308,981
1998	3.13%	2.23	1,603,443	180,345	136,707	307,789
1999	3.13%	2.24	1,619,522	171,042	138,026	315,198
2000	3.07%	2.23	1,635,928	145,112	134,321	318,433
2001	2.92%	2.04	1,442,612	150,278	126,402	324,040
2002	3.12%	2.22	1,530,831	173,882	150,192	365,464
2003	3.08%	2.18	1,490,607	168,472	167,287	354,243
2004	2.94%	2.13	1,448,256	171,559	167,564	340,484
Vision Goals						
2010	4%	3.3				
2020	5%	4.0				
2030	5%	5.0				

Table 3. Biopower: Annual Consumption and Technical Advisory Committee *Vision* goals