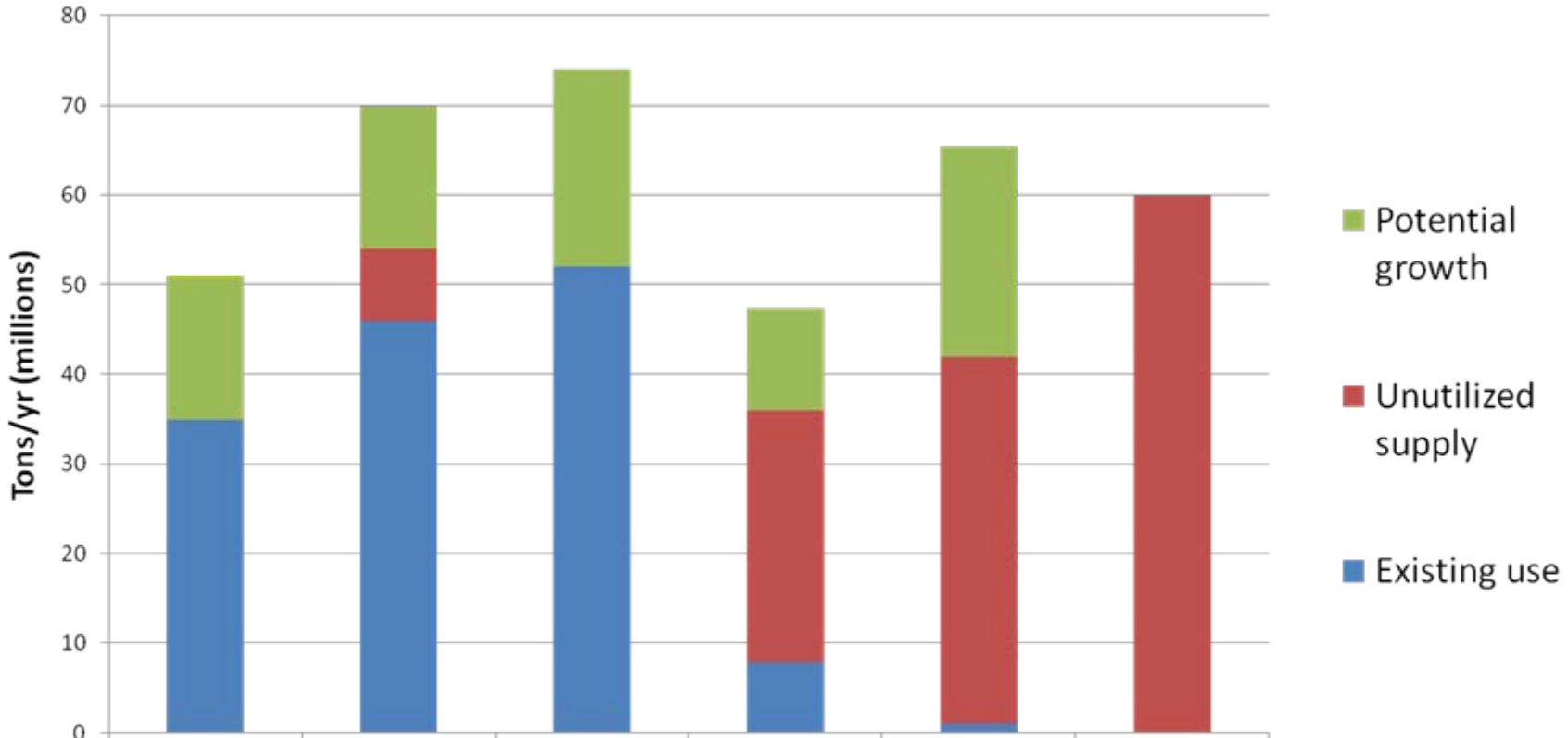
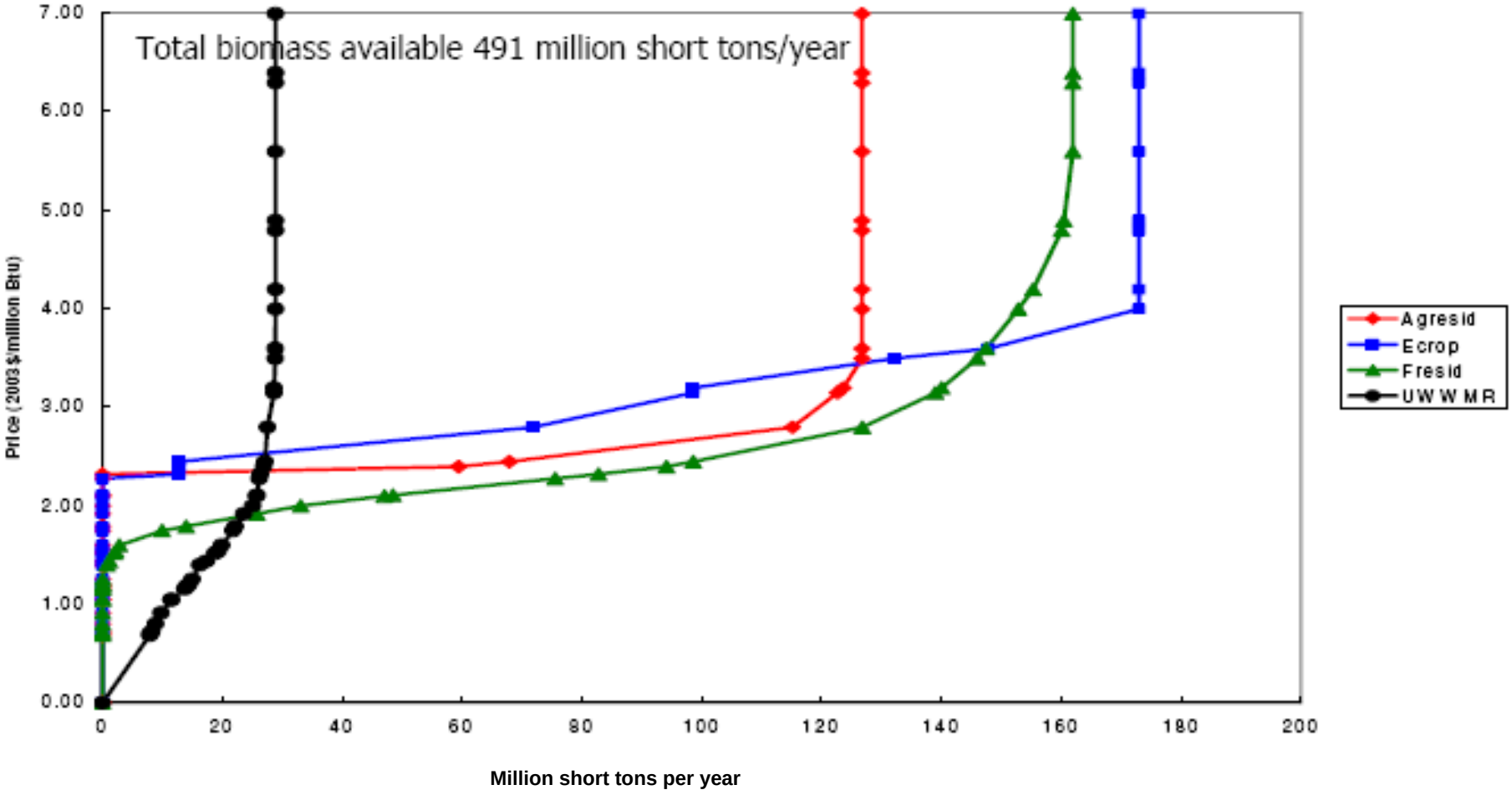
Figure 1. Current and potential wood supply for biomass energy



	Fuelwood (heating and electric utilities)	Secondary wood residues (forest industry)	Pulping liquors (forest industry)	Urban wood waste	Primary wood residues (logging and other)	Hazardous fuels treatments
Potential growth	16	16	22	11	23	
Unutilized supply		8		28	41	60
Existing use	35	46	52	8	1	

Source: Perlack et al. 2005. Biomass as Feedstock for a Bioenergy and Bioproducts Industry.

Figure 2. Availability of Biomass in the U.S.



Source: Energy Information Administration 2006

Figure 3. Biomass utilization in electric power and biofuels production, under both a 25 % RFS and 25 % RES, by 2025

[Millions of dry tons]

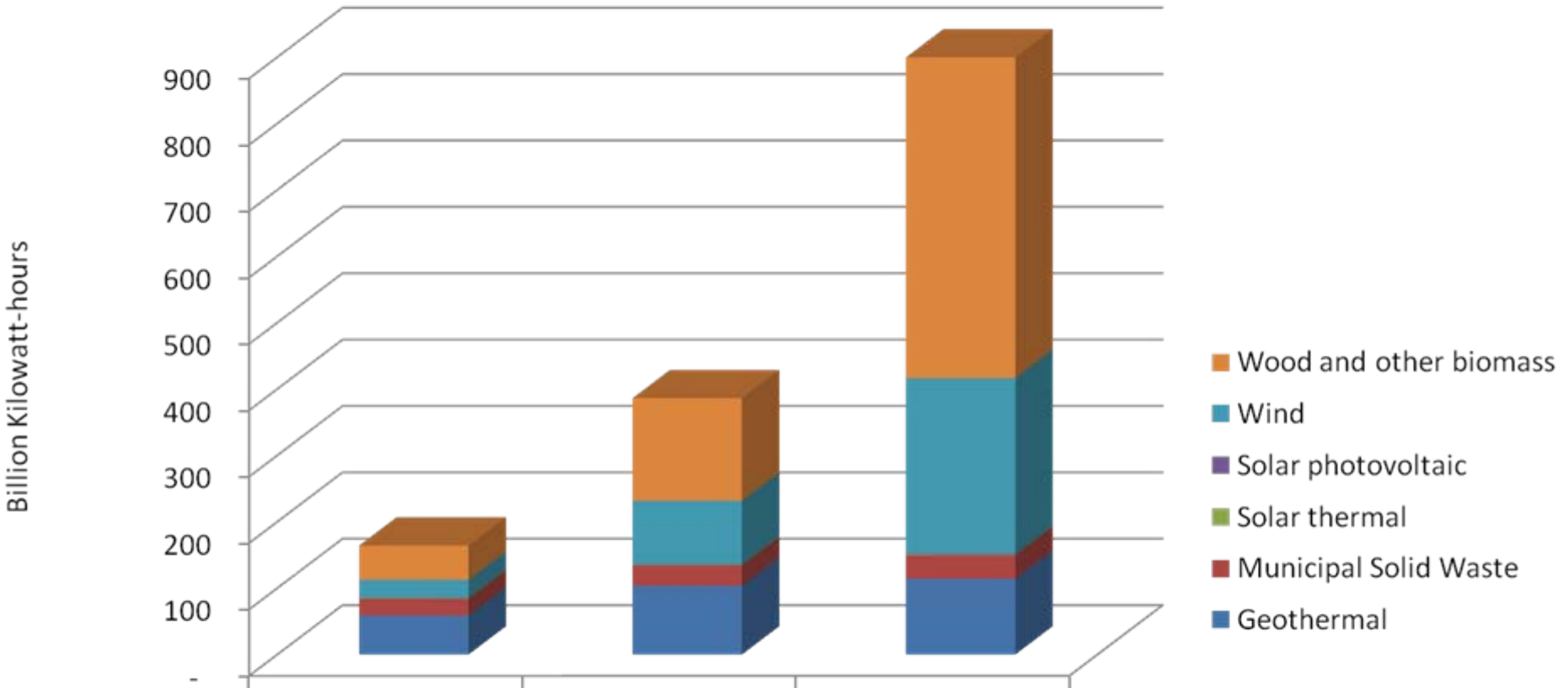
	2007	2025/1		
	Actual	25% RES/2	25% RFS/3	Total
Agricultural residues			127	127
Urban wood waste	8	25	4	29
Forest residues	47	120	42	162
Energy crops		71	102	173
Subtotal:	**55**	**216**	**275**	**491**
Wood	35	329	50	379
Total	**90**	**545**	**325**	**870**

1/ Energy Information Administration, 2007

2/ 495 billion KWh = 545 million bdT of biomass (assumptions: 2.2 gT=1000 KWh, 1.1 bdT=1000 KWh)

3/ 28 billion gallons ethanol = 325 million bdT of biomass (assumptions: 1 gT=43 gal, 1 bdT=86 gal)

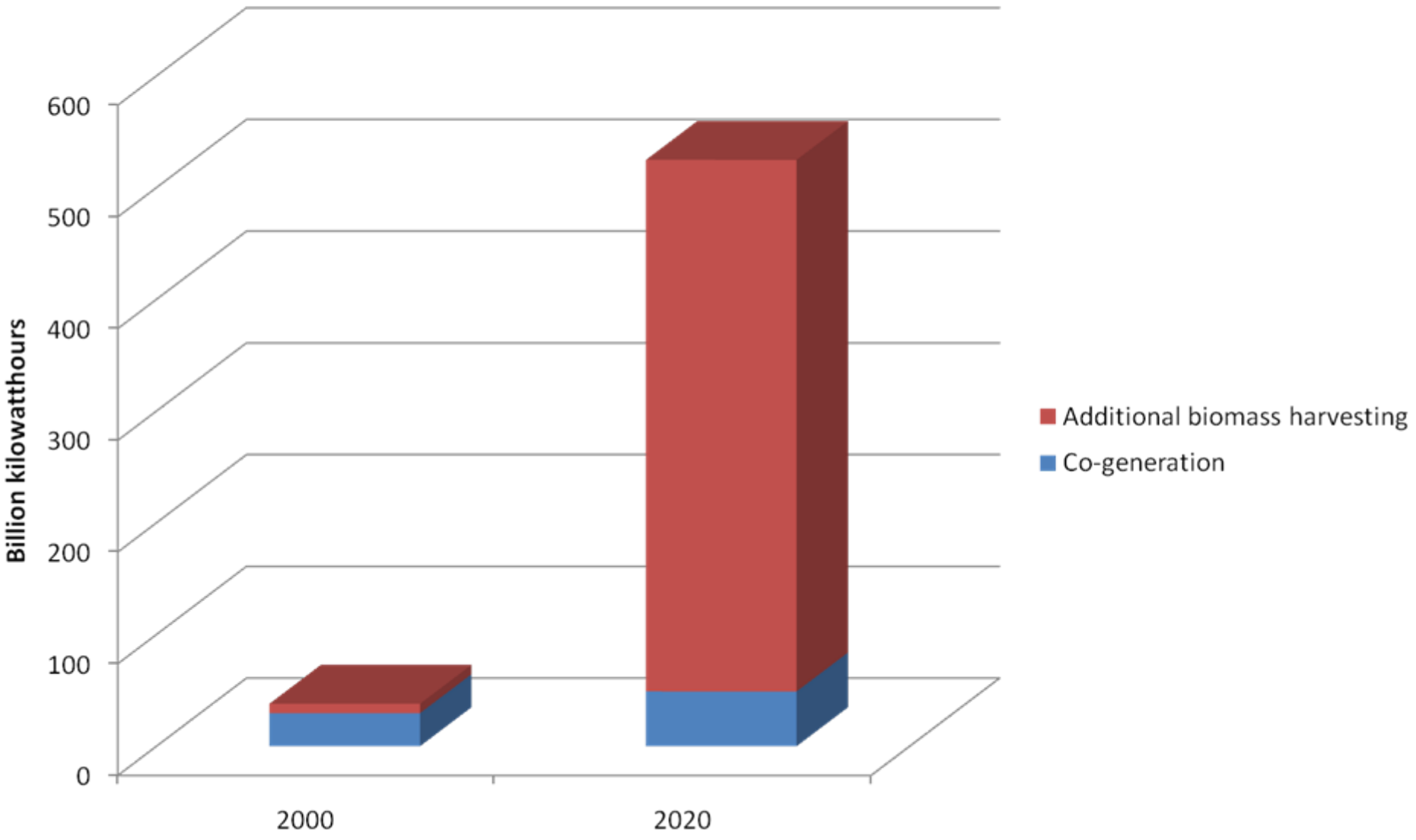
Figure 4. Projected Renewable Electricity Sources to 2020, with 20% RPS



	2005	2010	2020
Wood and other biomass	52	155	483
Wind	27	96	264
Solar photovoltaic	0	1	1
Solar thermal	1	1	1
Municipal Solid Waste	26	31	35
Geothermal	59	104	114

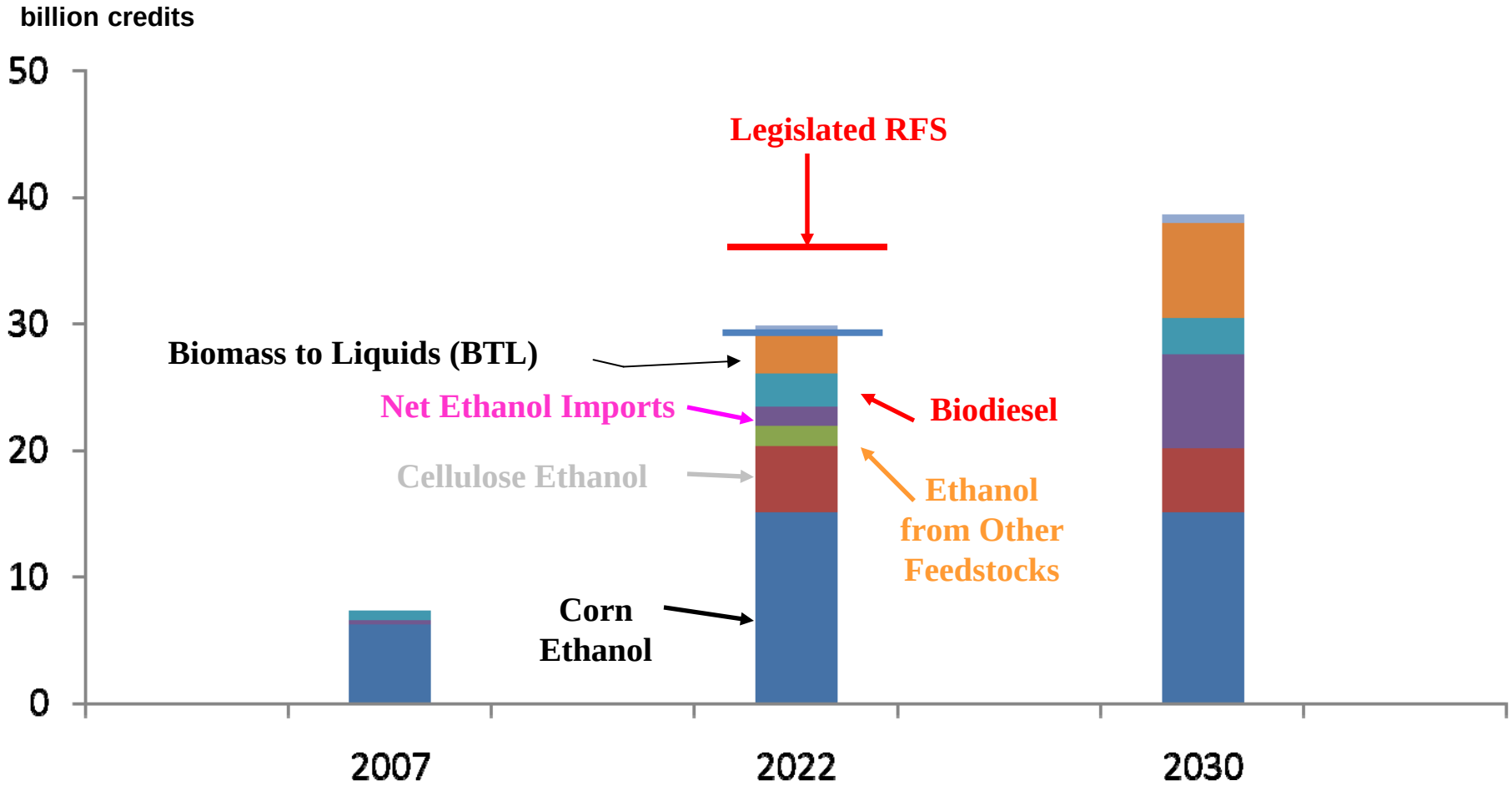
Source: Energy Information Administration 2002

Figure 5. Electricity Generation from Biomass with 20% RES



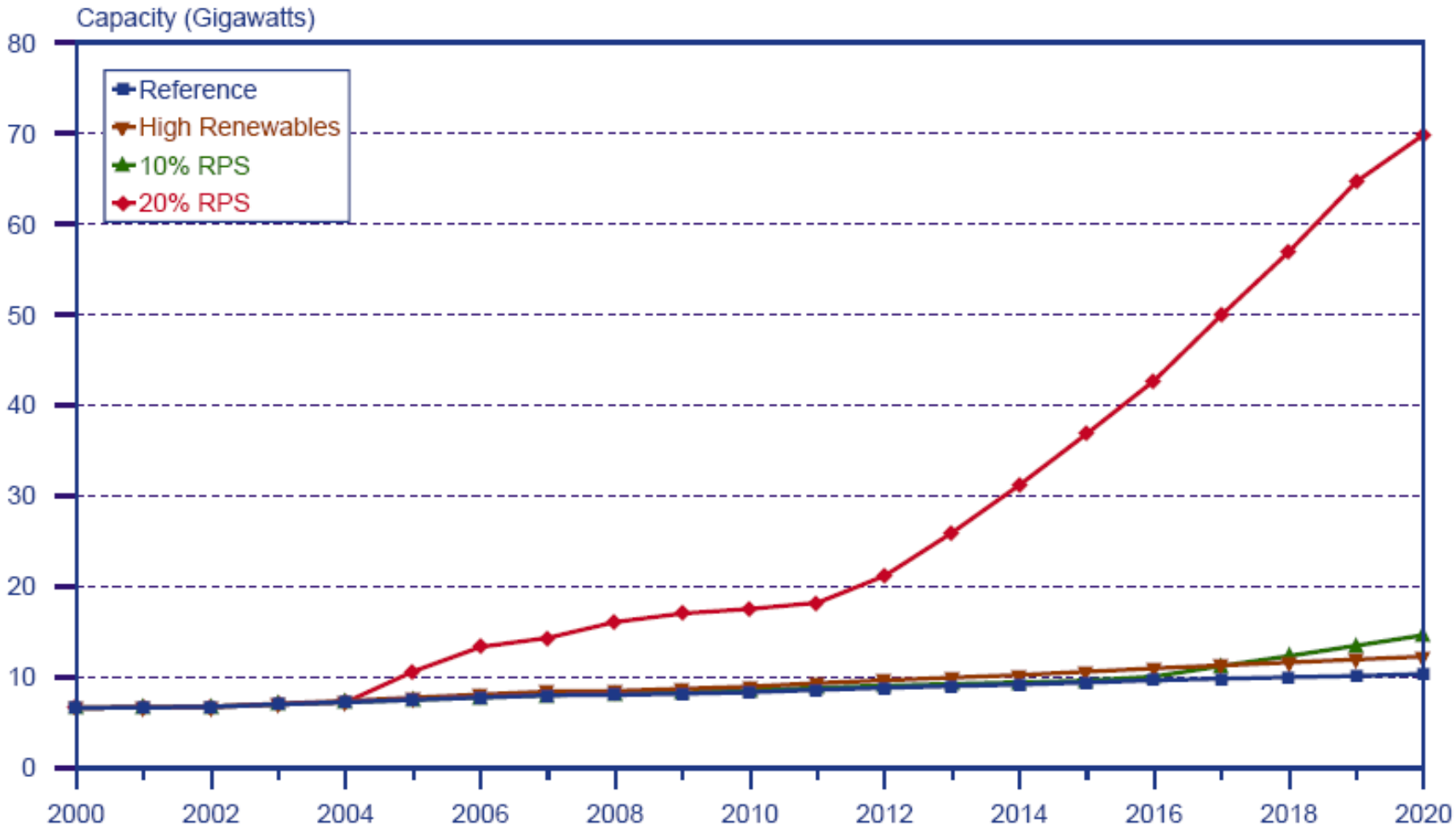
Source: Energy Information Administration 2003

Figure 6. Projected shortfall in achieving biofuels goals, 2022



Source: EIA Annual Energy Outlook 2009

Figure 7. Projections of Biomass-Fired Generating Capacity in Four Cases, 2000-2020



Source: EIA , 2003. Biomass for Electricity Generation

Figure 8. Relative efficiency of electricity, thermal, and cogeneration (CHP) facilities

	Size (MW)	Wood use (Green tons/yr)	Capital cost (US$millions)	Operations cost (US$millions	Efficiency (Percent)
Electricity only					
Utility plant	10-75	100,000-800,000	20-150	2-25	18-24
Industrial plant	2-25	10,000-150,000	4-50	4-50	20-25
School campus	N/A	N/A	N/A	N/A	N/A
Commercial/industrial	N/A	N/A	N/A	N/A	N/A
Thermal only					
Utility plant	14.6-29.3	20,000-40,000	10-20	2-4	50-70
Industrial plant	1.5-22.0	5,000-60,000	1.5-10	1-3	50-70
School campus	1.5-17.6	2,000-20,000	1.5-8	0.15-3	55-75
Commercial/industrial	0.3-5.9	200-20,000	0.25-4	0.02-2	55-75
Combined heat and power/1					
Utility plant	25(73)	275,000	50	5-10	60-80
Industrial plant	0.2-7(2.9-4.4)	10,000-100,000	5-25	0.5-3	60-80
School campus	0.5-1(2.9-4.4)	5,000-10,000	5-7.5	0.5-2	65-75
Commercial/industrial	0.5-2(2.9-7.3)	5,000	5	0.5-2	65-75

1. Sizes for combined-heat-and-power (CHP) facilities are a combination of electical and thermal capacity; the first figure is electrical and the figure in parentheses is thermal. 1 MW = 3.413 Btu/hour.

Source: USDA Forest Service. 2004. Techline: Wood Biomass for Energy WOE-1. Forest Products Laboratory, Madison, Wisconsin.

Next steps

- Regional biomass energy action plans
  (w/BERC, regional partner orgs.)
- Biomass harvesting guidelines & procurement standards *(w/NASF, FSC/SFI, et al.)*
- Spatial decision support tools *(w/FS, CBI)*
- Thermal/efficiency std. – meet 25x'25 through efficient utilization, *sustainable* management of forest resources, and maintenance of key conservation values

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