Perspectives on Forest Biomass Availability for Bioenergy

Forum on

Ensuring Forest Sustainability in the Development of Wood Biofuels and Bioenergy: Implications for Federal and State Policies

Resources and Conservation Center

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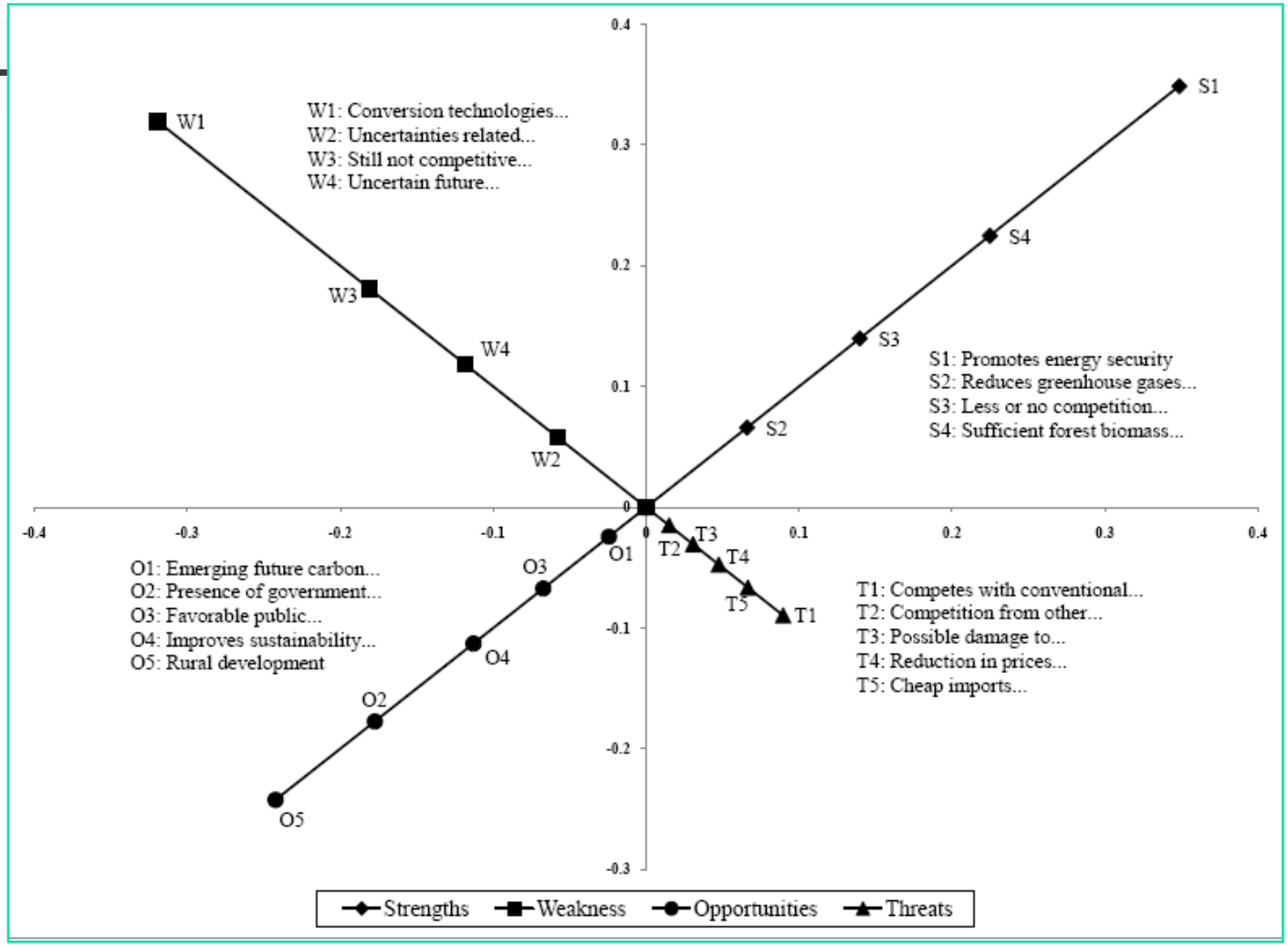
"Propositions" on forest biomass supply for bioenergy

- Potential for forest-based bioenergy is high
- Physical availability of forest biomass for bioenergy is known
- Commercial availability of forest biomass for bioenergy is less known

Potential for forest-based bioenergy is high

Perceptions of industry stakeholder group



Dwivedi & Alavalapati (in press in Energy Policy)

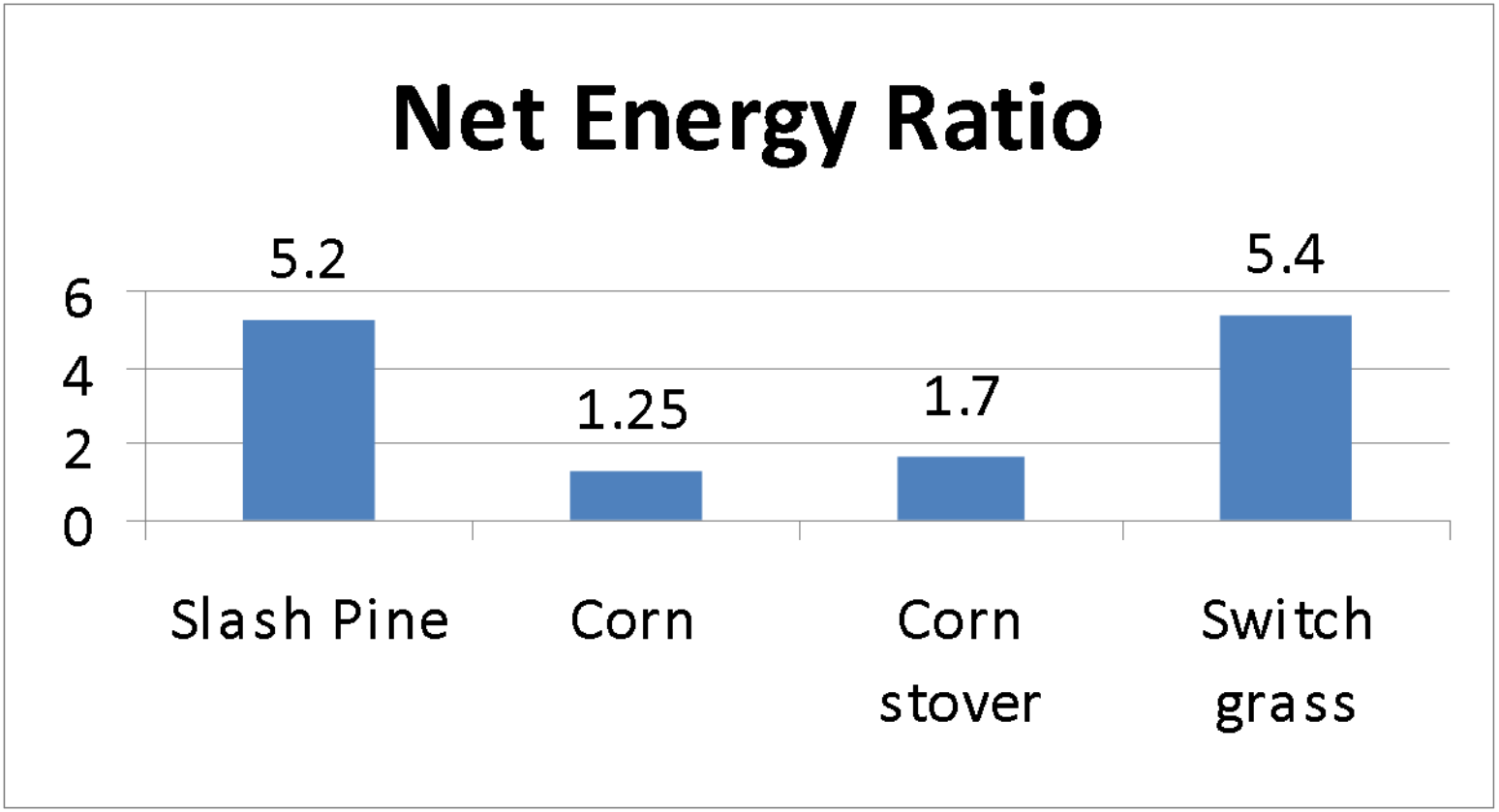
Public preferences for forest biofuels

- Willingness to pay a premium for E10 and E85 blending to realize environmental services ($/gallon)

Blend	AK	FL	VA
E10	**0.56**	**0.58**	**0.48**
E85	**0.82**	**1.17**	**0.86**

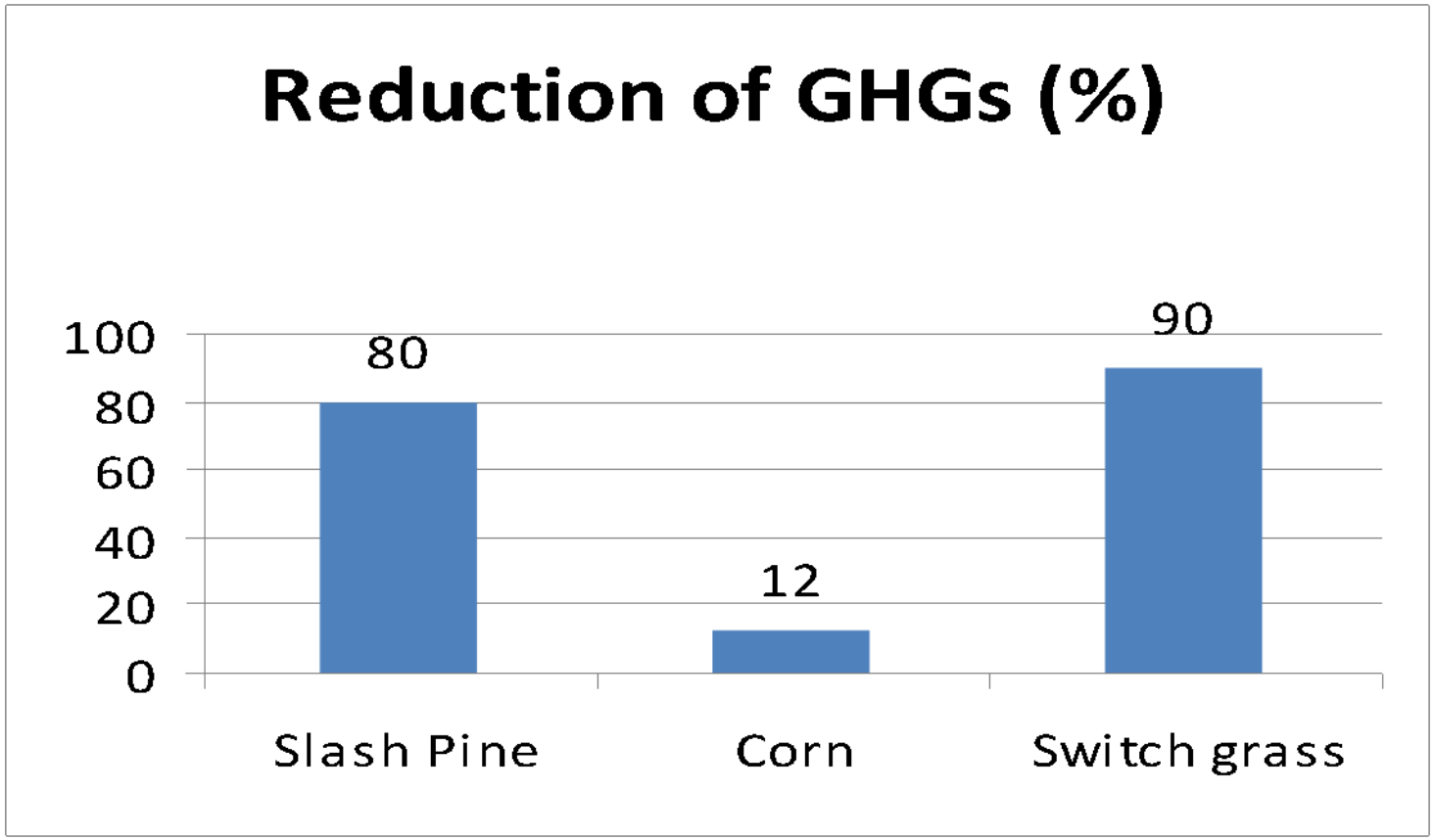
Susaeta & Alavalapati (in review)

Results of lifecycle analysis: Net energy ratios of slash pine ethanol



(Dwivedi, Alavalapati, Nesbit, & Lindner (in review)

Results of lifecycle analysis: Reduction of GHGs from slash pine ethanol



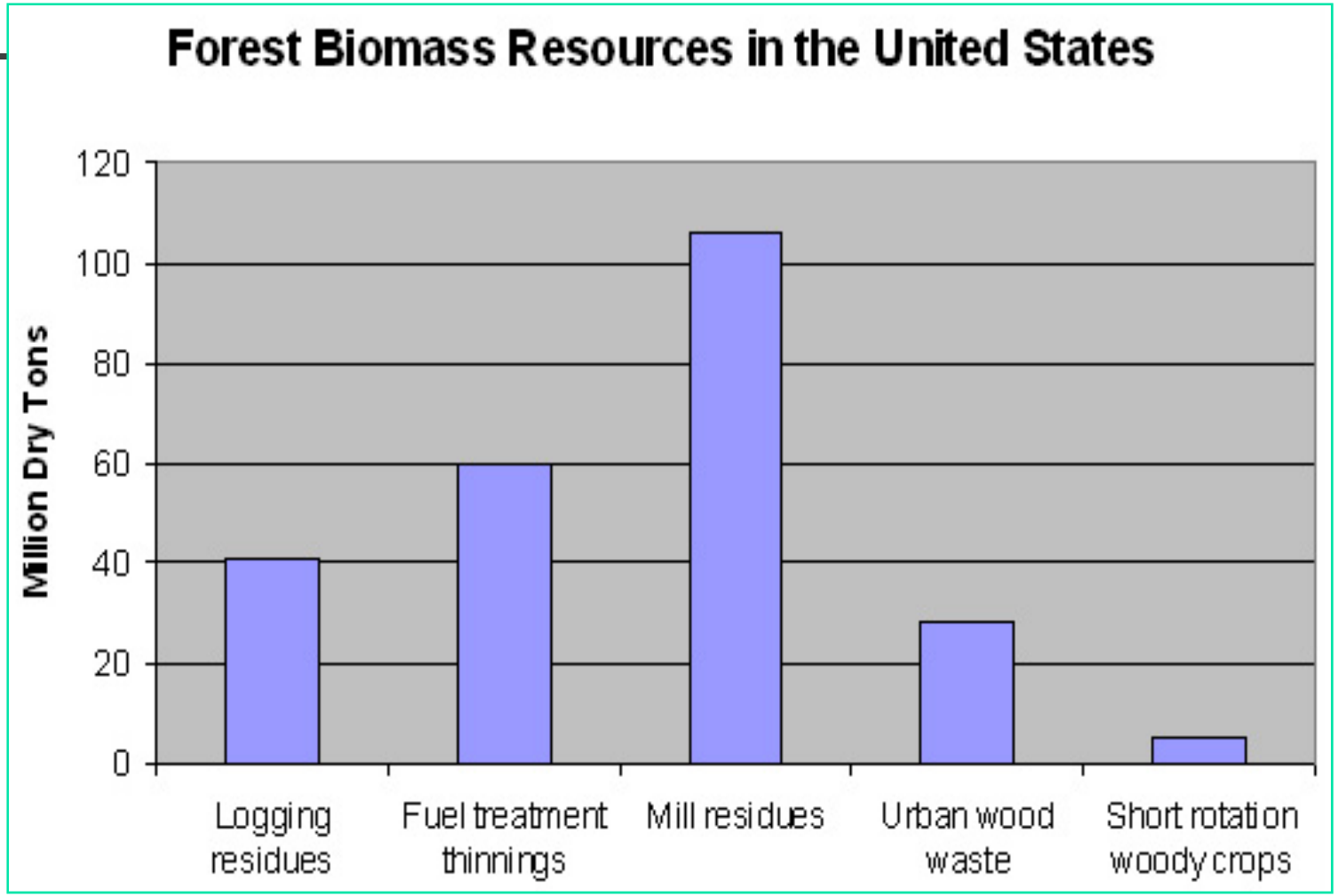
(Dwivedi, Alavalapati, Nesbit, & Lindner (in review)

Increase in forestland values under bioenergy scenarios

Scenarios	No thinning scenario		Thinning scenario for pulpwood		Thinning scenario for bioenergy	
Risk\salvage	k =0.8	k=0	k=0.8	k=0	k=0.8	k=0
λ = 0.03	649.26	556.19	679.19	537.05	686.82	543.36
λ = 0.02			748.27	641.49	756.79	649.03
λ = 0.01			822.29	762.33	831.80	771.29
λ = 0			901.11	901.11	911.69	911.69

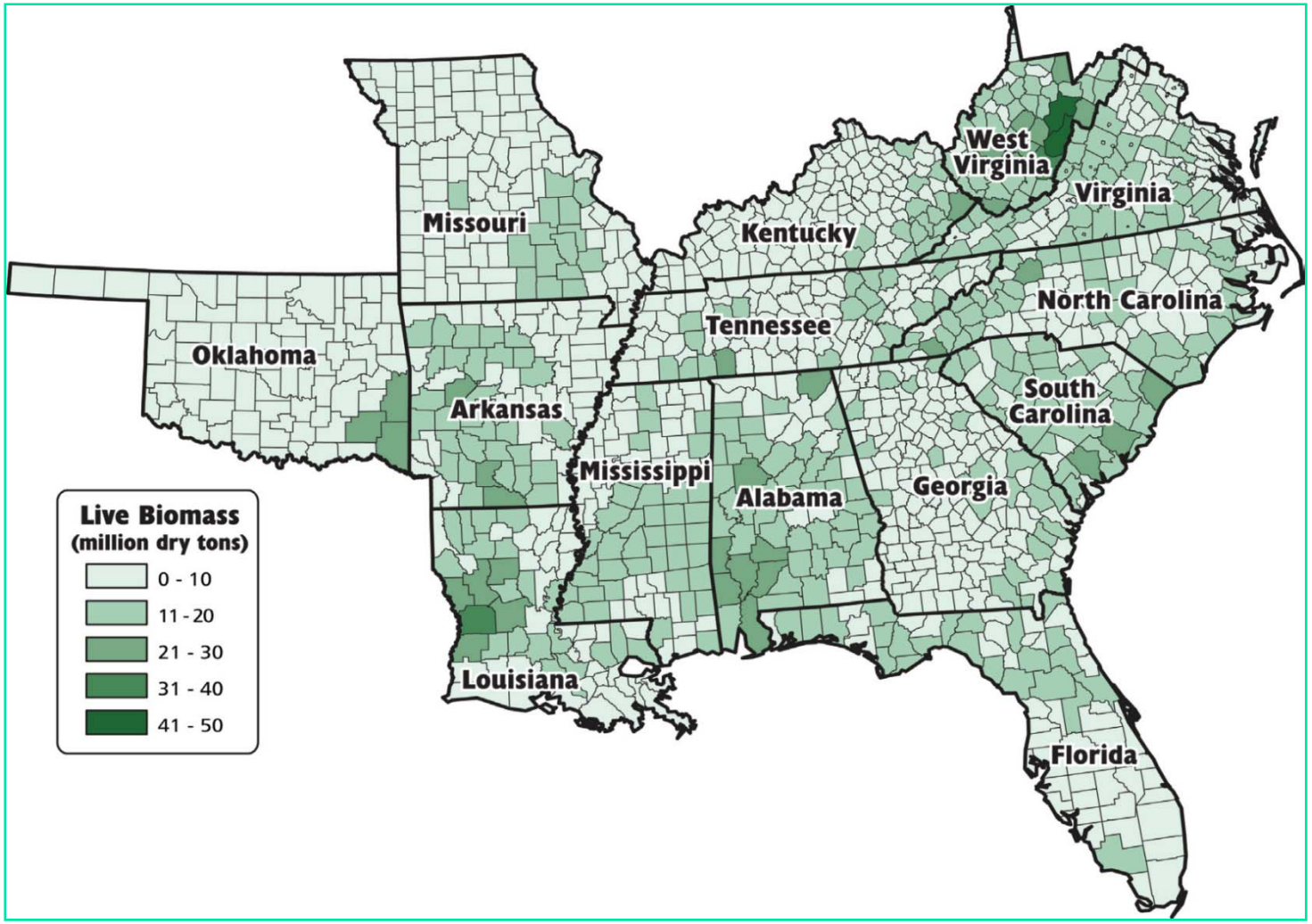
Susaeta, Alavalapati, & Carter (in press in Natural Resource Modeling)

Physical availability of forest biomass for bioenergy is known



Perlack et al. 2005

Physical availability of forest biomass in the U.S. Southeast

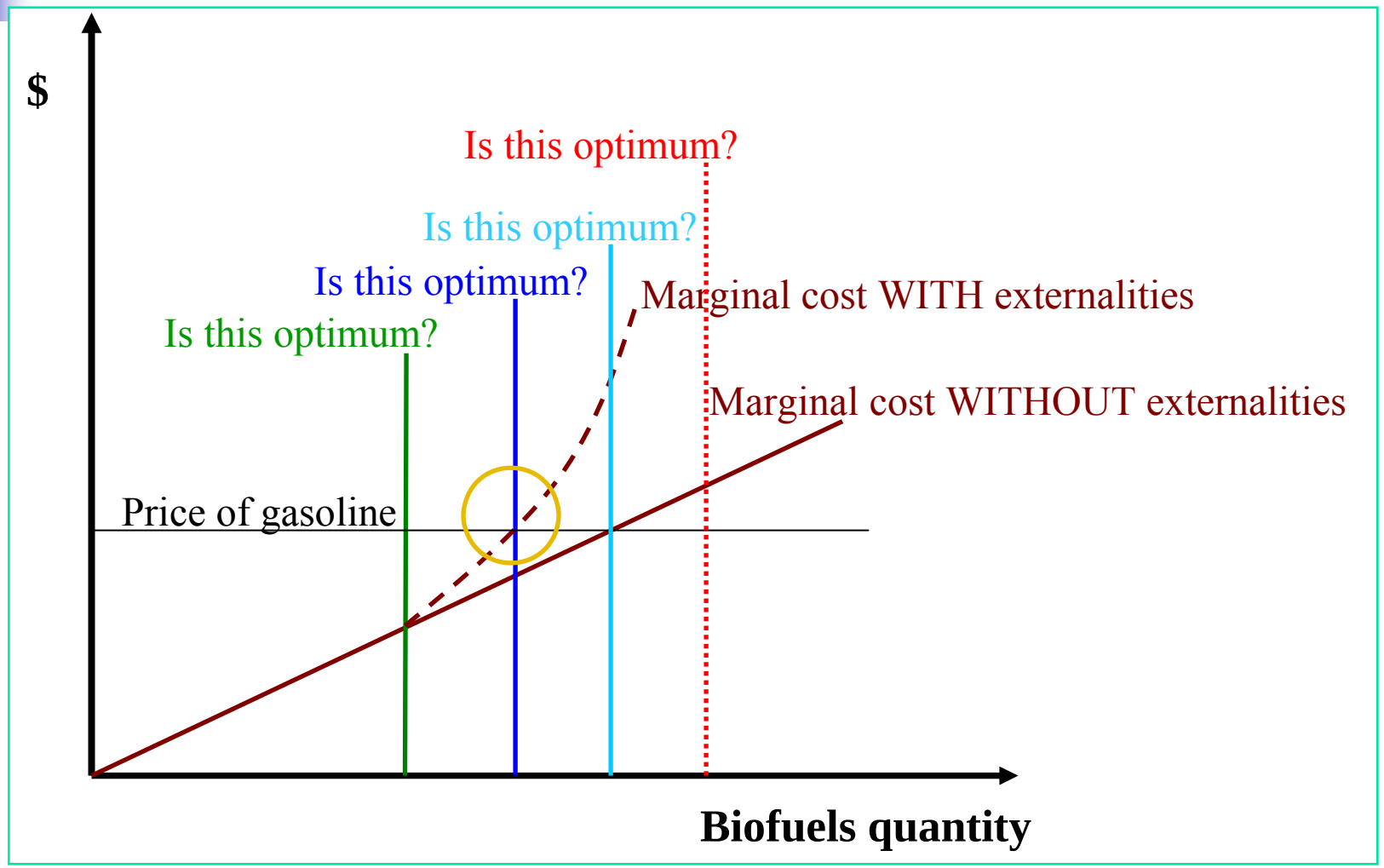


Forest biomass in Southern region

State	Timberland Area (million ha)	Live Biomass (million dry tons)	Roundwood Production (million m^3)	Timber Removals (million m^3)	Logging Residues (million m^3)	Net Annual Growth (million m^3)	Energy Value (billion MJ)
Alabama	9.15	882.40	31.69	32.77	7.21	42.83	191.49
Arkansas	7.49	761.60	20.03	22.95	184.70	29.10	130.13
Florida	6.76	529.00	15.01	16.27	119.20	20.81	93.06
Georgia	10.08	1032.70	34.07	37.96	329.10	54.58	244.05
Kentucky	4.90	621.20	5.84	8.39	107.40	13.30	59.48
Louisiana	5.71	594.70	20.99	24.29	276.10	23.58	105.43
Mississippi	6.11	590.10	4.69	30.98	89.00	35.32	157.90
Missouri	7.94	812.60	26.54	5.30	326.80	12.42	55.52
North Carolina	7.53	935.40	24.31	30.44	211.60	41.30	184.67
Oklahoma	2.19	155.40	9.48	3.92	95.70	6.89	30.80
South Carolina	5.22	573.50	17.04	19.01	151.40	29.37	131.33
Tennessee	5.67	726.70	9.60	10.69	67.70	22.69	101.44
Virginia	6.36	859.60	15.15	18.24	155.00	27.09	121.14
West Virginia	4.86	820.10	4.64	4.49	100.70	12.35	55.24
Region Total	89.96	9895.00	239.06	265.70	2221.61	371.65	1661.66

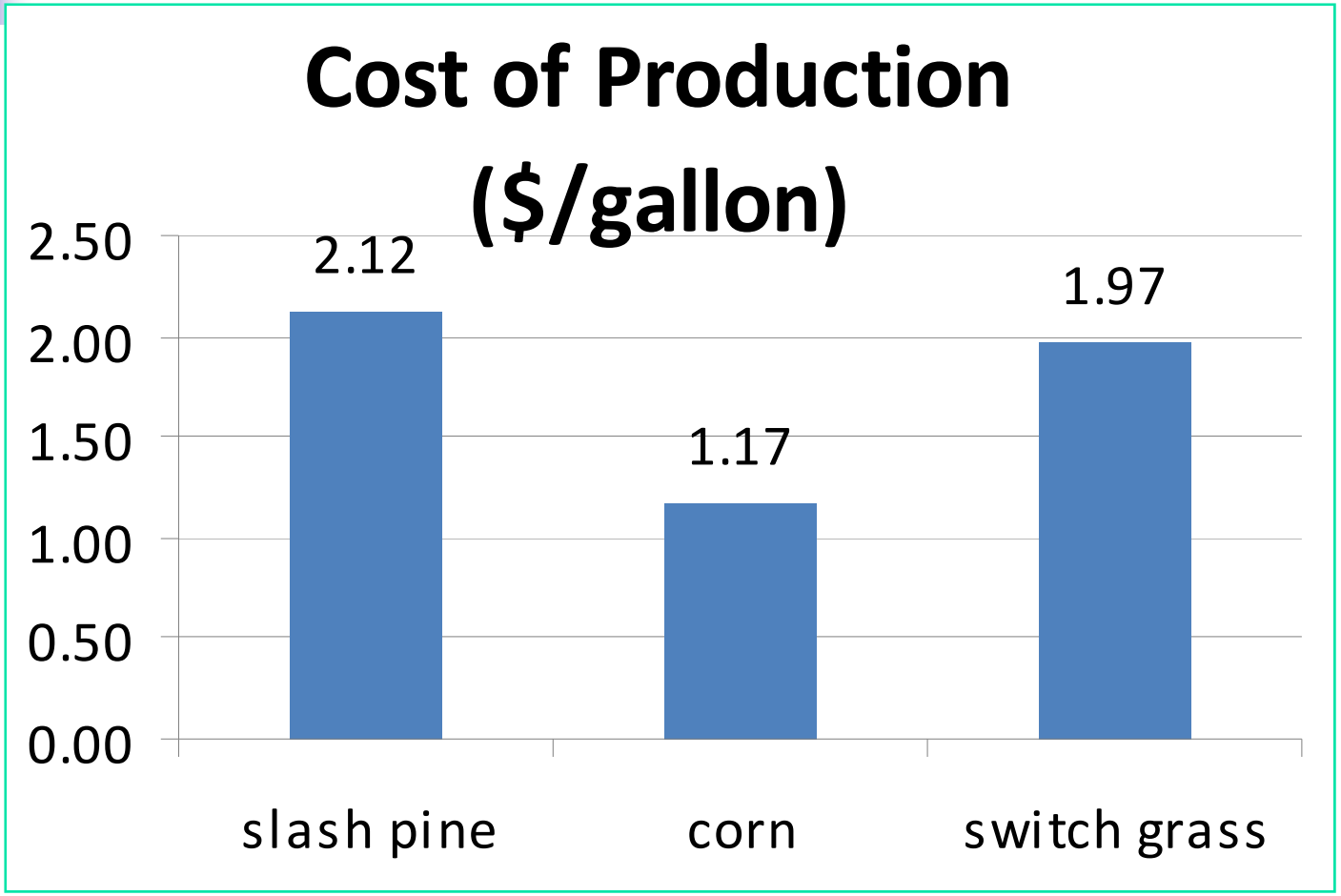
Dwivedi & Alavalapati (in press in Energy Policy)

Commercial availability of forest biomass for bioenergy is less known



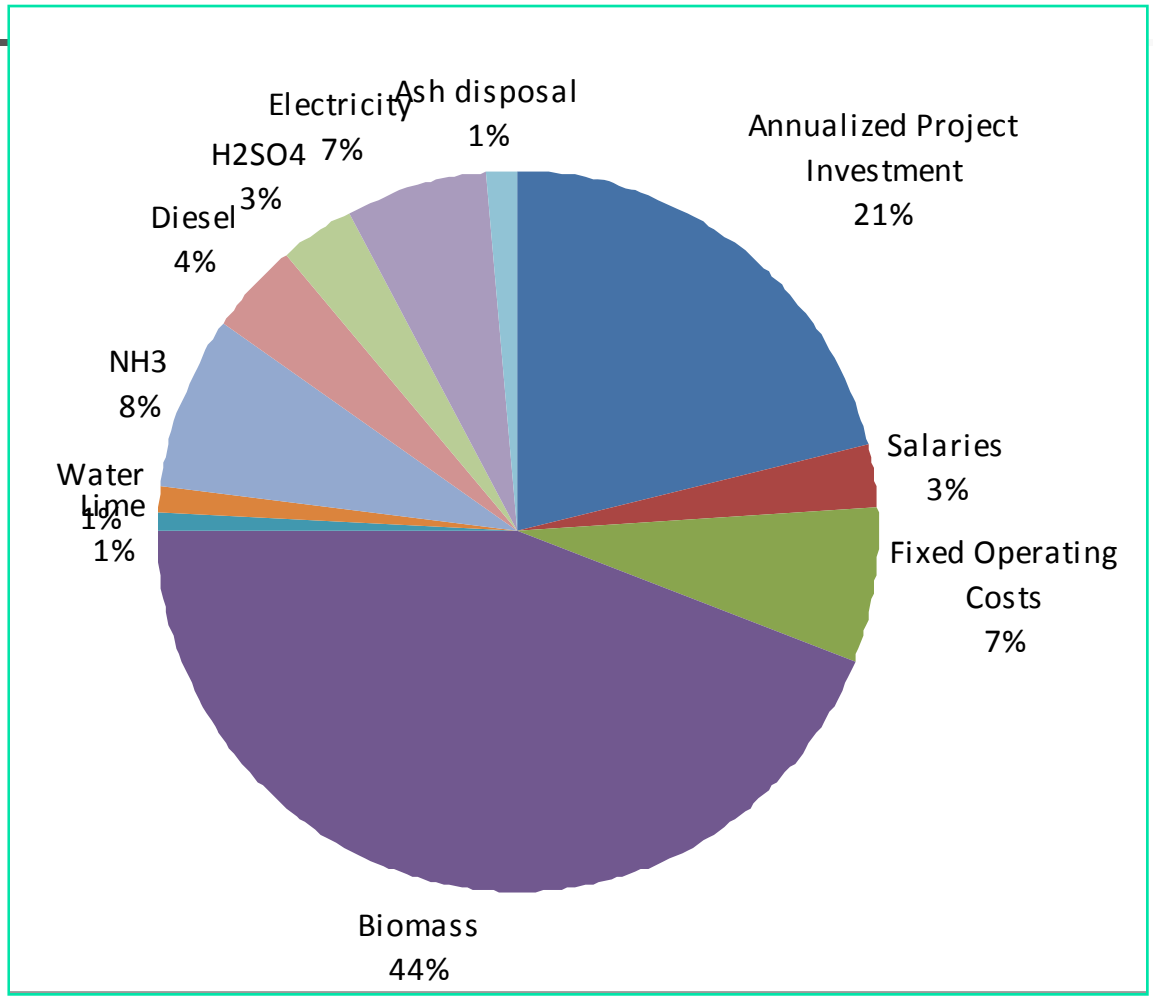
Unit cost influence commericial availability

Unit cost of ethanol



(Dwivedi, Alavalapati, Nesbit, & Lindner (in review)

Unit cost of slash pine ethanol



(Nesbit, Alavalapati, Dwivedi, & Lindner (in review)

Government Policies influence commercial availability

- In the U.S. Southeast, ten states have regulatory mechanisms
  - Renewable Fuel Standards,
  - Net Metering and Interconnection Standards, and
  - Alternative Fuel Vehicle (AFV) acquisition
- 13 of the 14 states studied provided incentives (tax breaks, subsidies or grants or loans
  - Ex: Kentucky, qualified biodiesel producers or blenders are eligible for an income tax credit of $/gallon of pure biodiesel
  - Only West Virginia has offered no incentive for the production of alternative fuels.