

Renewable Power in Indiana: Economic Viability and Policy Cost-Effectiveness

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Based on joint work with Wally Tyner, Jinho Jung,
Michael Wetzstein, Nate Trull, and others

Presentation Outline

- Economics of residential PV systems
 - Current (State and Federal) Policies (including SB 309)
 - Prospective Policies
- Economics of co-firing coal with biomass

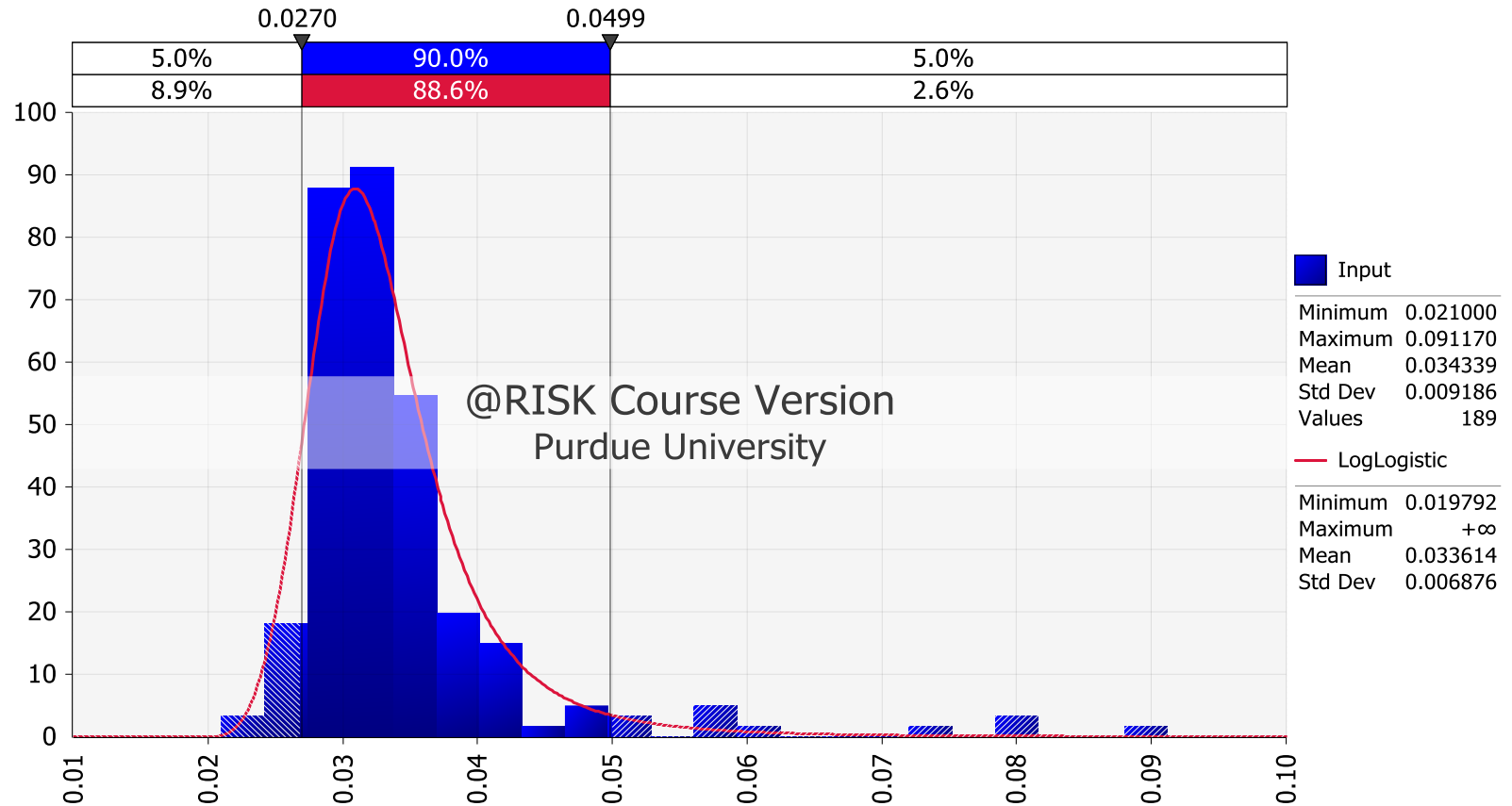
Economics of Solar Panels

Policy	Effectiveness		
	Trigger savings (A)	Actual Savings (B)	Policy effectiveness
(0) No policy	\$0.24/kW h	\$0.10/kW h ^a	0.42
(1) Net metering	\$0.24/kW h	\$0.12/kW h	0.47
(2) HEL	\$0.23/kW h	\$0.10/kW h ^a	0.44
(3)=(1)+(2)	\$0.23/kW h	\$0.12/kW h	0.49
(4) FTC	\$0.17/kW h	\$0.10/kW h ^a	0.60
(5)=(4)+(1)	\$0.17/kW h	\$0.12/kW h	0.67
(6)=(2)+(4)	\$0.16/kW h	\$0.10/kW h ^a	0.64
(7)=(1)+(2)+(4)	\$0.16/kW h	\$0.12/kW h	0.72

^a Calculated as the product of retail price (\$0.115/kW h) and solar kW hs consumed (θ_{annual}).

The combination of federal and state policies takes PV panels 72% of the way to competitiveness with regular grid electricity in Indiana

Frequency of average marginal prices of electricity paid by the electricity supplier

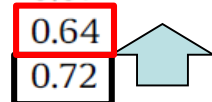


Source: US EIA (<https://www.eia.gov/electricity/wholesale/#history>)

SB 309 - Provides that the rate for excess distributed generation procured by an electricity supplier must equal the product of: (1) the average marginal price of electricity paid by the electricity supplier during the most recent calendar year; multiplied by (2) 1.25.

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SB 309 reduces the competitiveness of solar panels and the effectiveness of prospective policies such as ToD pricing

Co-firing with biomass

- Rejuvenation (technological adaptation for co-firing) delays replacement (**Stutzman et al. IJPE**)
- Our latest research suggests biomass may be more competitive
- Plants may have to compete for biomass
 - this transfers “rents” to ag sector
- Limitations to residue supply may create an opportunity for energy dedicated crops
 - procuring them alleviates competitive pressure

Co-firing with biomass

- “Value” of biomass (rejuvenation) may be understated due to:
 - Assumption of fixed feedstock mix
 - Biomass supply response and composition
- “Value” of biomass may be overstated due to:
 - Elimination(?) of Clean Power Plan – BUT “green pricing” – previous research shows relatively large WTP for renewable energy

Thank you!

(views expressed here do not necessarily represent Purdue University)

Questions and Comments

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