WHY HAVE SO MANY STATES IN THE U.S. ADOPTED A RENEWABLE PORTFOLIO STANDARD FOR POWER SALES?

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Table 1: RPS States

State	Non-Hydro Renewable Percent of Total Generation (2001)	Year RPS First Enacted	RPS Target Percent	Target Year
Arizona	0.0%	2001	1.1%	2007
California	11.0%	2002	20.0%	2017
Colorado	0.1%	2004	10.0%	2015
Connecticut	0.6%	1998	10.0%	2010
Iowa	1.5%	1991	2.0%	1999
Maine	20.9%	1999	30.0%	2000
Maryland	0.1%	2004	7.5%	2019
Massachussetts	5.4%	1997	4.0%	2009
Minnesota	4.7%	2001	19.0%	2015
Nevada	3.5%	2001	15.0%	2013
New Jersey	2.2%	1999	6.5%	2008
New Mexico	0.1%	2002	10.0%	2011
New York	0.2%	2004	24.0%	2013
Pennsylvania	1.4%	2004	8.0%	2020
Rhode Island	0.1%	2004	16.0%	2019
Texas	6.0%	1999	2.7%	2009
Wisconsin	2.2%	1998	2.2%	2011
All United States	2.1%		None	
European Community			22.1%	2010

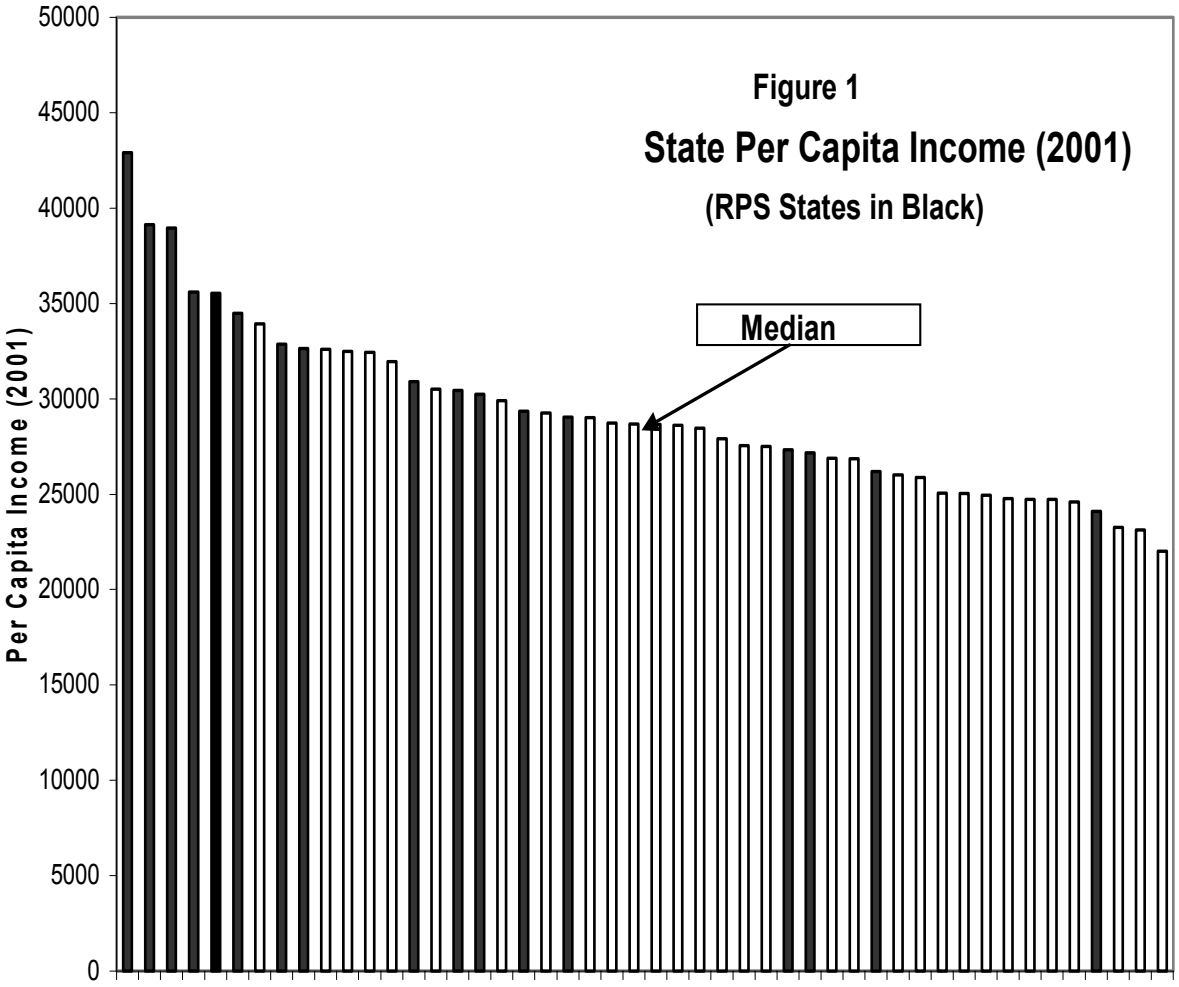
Note:
The Massachussetts standard applies to "new" green power, i.e., power from facilities built after 1997. Hawaii and Washington D.C. excluded from this table and this paper.

Sources:
Interstate Renewable Energy Council website at http://www.irecusa.org
Union of Concerned Scientist website at http://www.ucsusa.org/index.cfm
U.S. Energy Information Administration at http://www.eia.doe.gov

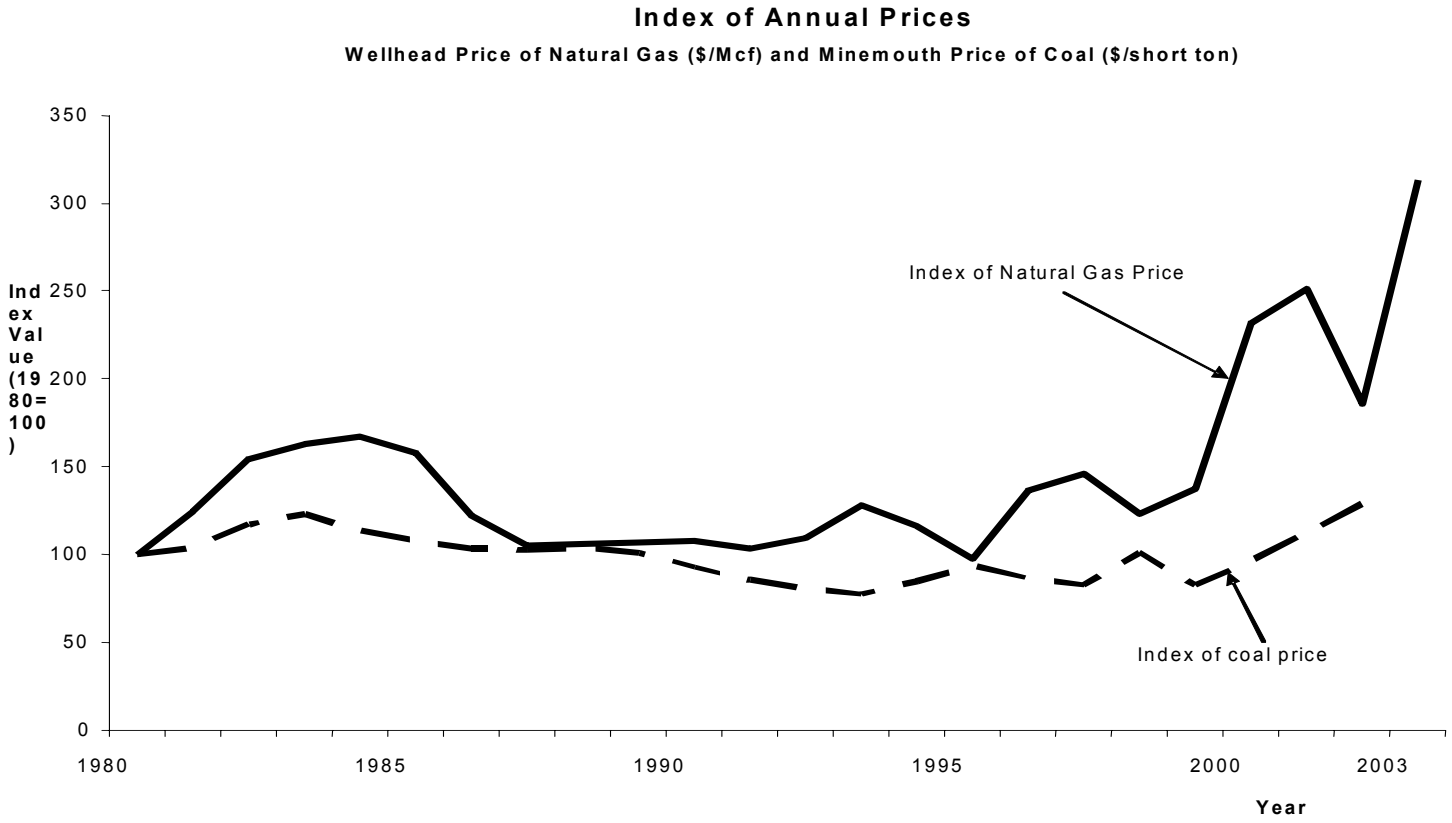
THE STATISTICAL MODEL: General Form

- This paper employs a binary logit model of the form:
- **RPS01** = f(**E**, **D**, **I**)
- **RPS01** is a binary variable equal to one if the state has adopted an RPS and zero otherwise.
- **E** is a variable reflecting the motive to improve the environment. Below, this variable is proxied by state per capita income using the reasoning behind the environmental Kuznets curve.
- **D** reflects the desire to diversify energy inputs into power generation. This variable is proxied by the in-state power generating industry's existing exposure to natural gas, i.e., the fuel that is likely to be used less if an RPS is adopted.
- **I** reflects the intent to develop an in-state renewable power industry. The two proxies used below to capture this are the existing in-state market share of renewable resources in electricity production and wind power potential (the least cost renewable resource

States with High Per Capita Income Are More Likely to Have Chosen and RPS

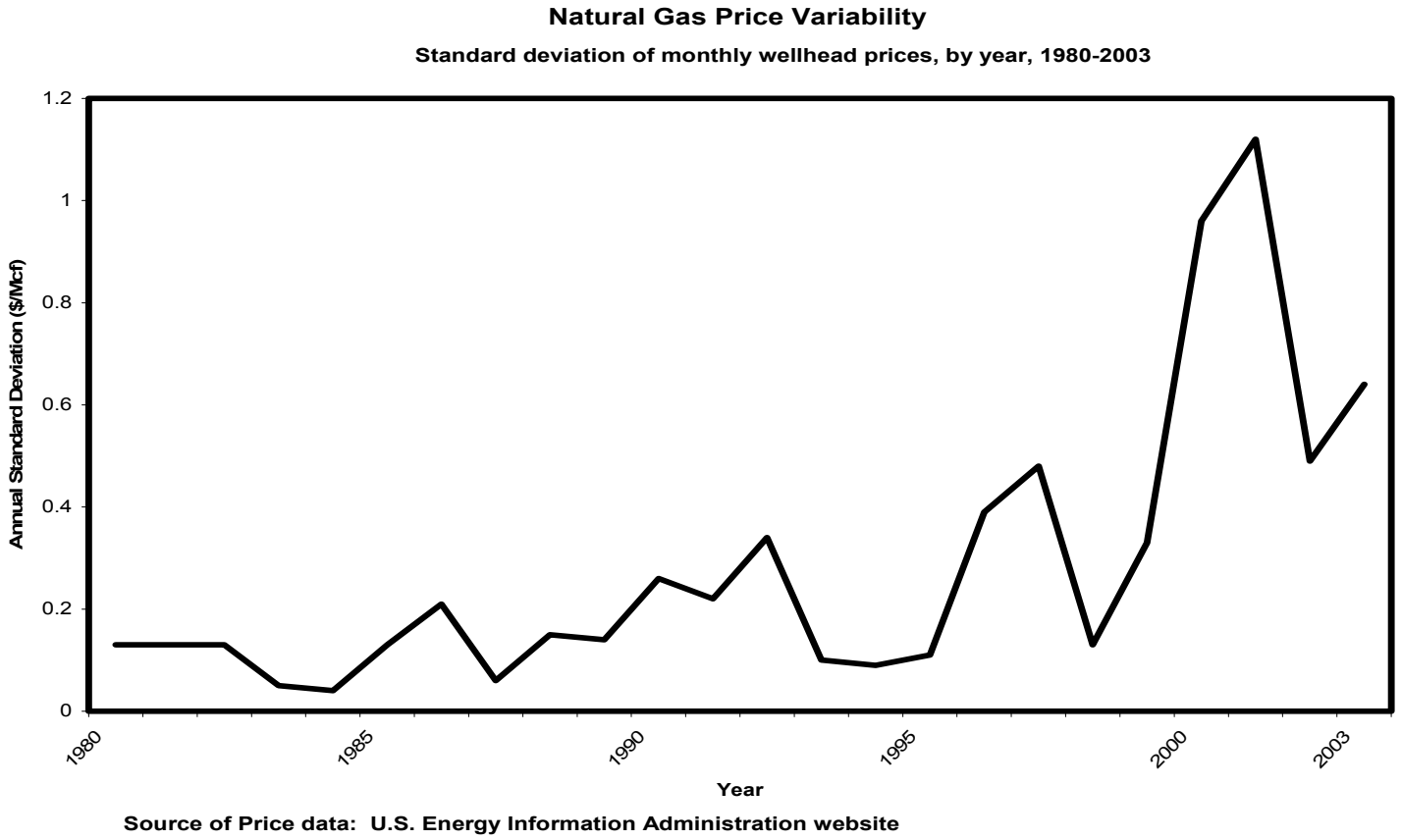


Natural Gas Has Been Getting Relatively More Expensive

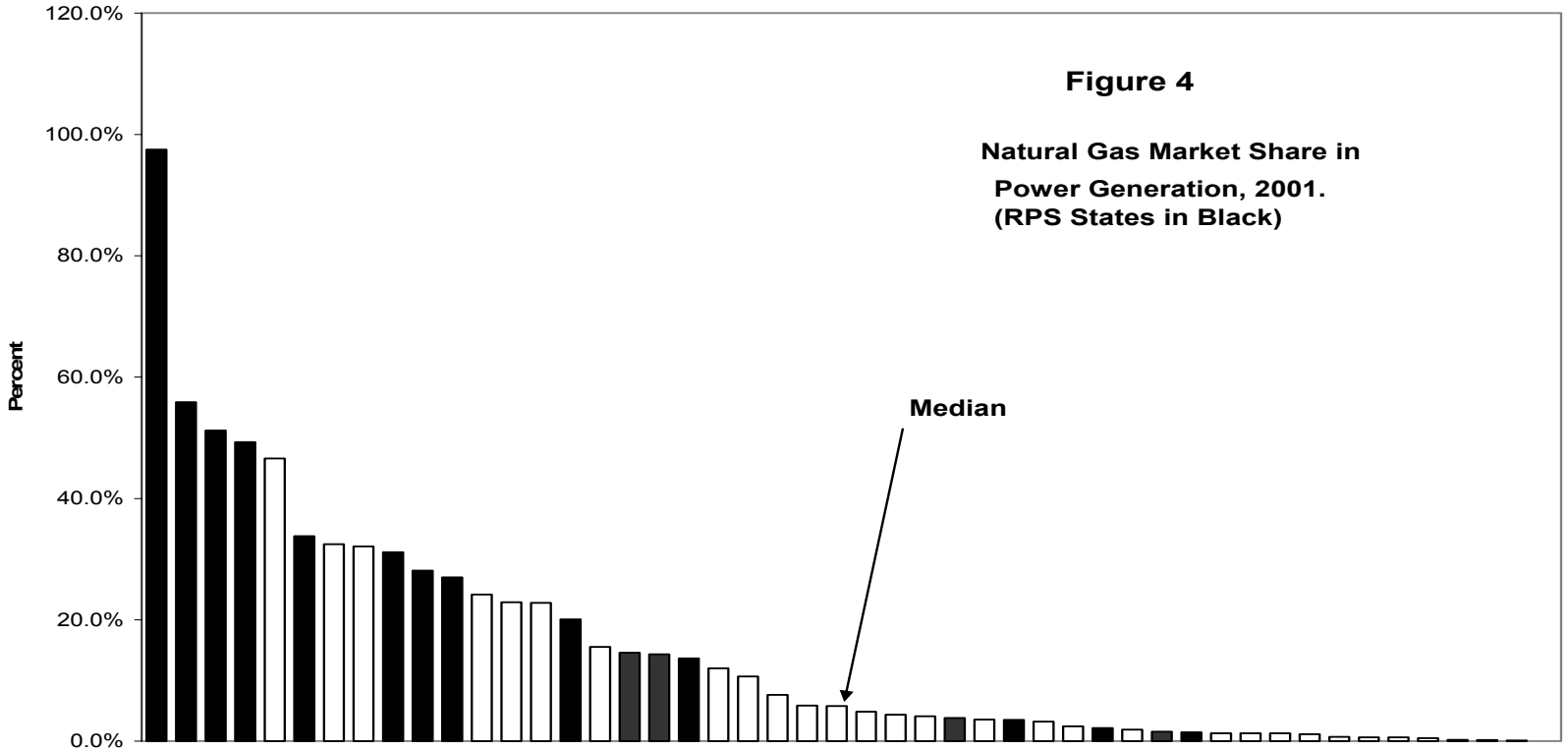


Source: U.S. Energy Information Administration website

- And Gas Price Volatility Has Increased



States With High Gas Exposure Have Tended to Choose and RPS



The Estimated Model

- The estimated statistical model is:
- **RPS01** = g(**PCINCOME**, **PERGAS**, **PERRENEWABLE**, **WINDEX**)
- , where
- **RPS01** = a binary decision variable equal to 1 if the state has adopted an RPS and zero otherwise;
- **PCINCOME** = state per capita income in 2001, in dollars.
- **PERGAS** = percent of in-state power generation from natural gas (2001);
- **PERRENEWABLE** = percent of in-state power generation from renewables (2001); and
- **WINDEX** = an index of potential wind power generation in the state

TABLE 2: LOGIT ESTIMATION OUTPUT

Dependent Variable: **RPS01**

Method: ML - Binary Logit

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-10.27117	3.423707	-3.000014	0.0027
PCINCOME	0.000292	0.000111	2.628753	0.0086
PERGAS	5.325108	2.600851	2.047448	0.0406
PERRENEWABLE	5.579489	11.91891	0.468121	0.6397
WINDEX	1.706824	5.977720	0.285531	0.7752

Mean dependent var	0.354167	S.D. dependent var	0.48332
S.E. of regression	0.389153	Akaike info criterion	1.07322
Sum squared resid	6.511922	Schwarz criterion	1.268143
Log likelihood	-20.75743	Hannan-Quinn criter.	1.14688
Restr. log likelihood	-31.19942	Avg. log likelihood	-0.43244
LR statistic (4 df)	20.88398	McFadden R-squared	0.33468
Probability(LR stat)	0.000334		
Total obs	48		
Percent correct predictions:	93.55%	Percent incorrect:	6.45%