Would Energy Tax Policy Significantly Influence the Diffusion Rate of The Renewable Energy Portfolio in The United States?

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Outline

✓ Introduction
✓ Contributions to Literature Review
✓ Research Questions
✓ Methodology
✓ Empirical Result
✓ Research Findings
✓ Conclusion
Introduction

• The federal government provides financial support for energy development through tax credits.

• In 2015, 56% of the federal energy subsidies allocated to support renewable energy development.
Introduction

Tax Preferences, by Type of Fuel or Technology, 1985 to 2016. Residential Renewable Energy Tax Credit is established by the Energy Policy Act of 2005. In 2005, federal tax credit for residential energy property is applied to solar electric systems (tax credit increase by 30% more), solar water heating systems and fuel cells. In January 2008, tax credit is extended to small wind energy systems and geothermal heat pumps.
Contributions

• Dulal et al. (2013) find out that government intervention is crucial if countries move to renewable energy sources.

• Omri et al. (2014) consider three different income level of sample countries. In their theoretical model, they address the important factors that effect renewable energy consumption such as oil prices trade openness.

• Reboredo C. Juan (2015) studies the effect of reducing the dependence on finite fossil fuels and investing in the renewable energy industry.
Contributions
Renewable Energy Consumption In United States: Trillion British thermal unit (Btu)
Research Questions

1. How federal funds on renewable energy production might cause more consumption of renewable energy?
2. Did the depleted nonrenewable energy resources import help to spur renewable energy consumption growth in the United States?
Results

• Our empirical results indicate that inward tax credit is an important vehicle for achieving renewable energy development. Commercial, industrial, and transportation consumption of renewable energy significantly increase.

• Crude oil prices, gas prices and electricity prices impact renewable energy consumption in the United States, which reflect the fact that crude oil and gas are substituted with electricity in consumption.
Data

• The data for renewable energy consumption is collected from U.S. Energy Information Administration.

• The analysis of energy tax policy to renewable energy is performed using annual aggregated tax credit data from Congressional Budget office from 1985-2015.
Subscript $t = 1985, \ldots, 2015$ indicates the time period. $\mathcal{E}$ is the error term and is assumed to be independent, with mean of zero and constant variance. 

gCRE is the consumption of renewable energy growth. 
gPoil is oil prices inflation 
gPgas is gas prices inflation 
gPcoal is coal prices inflation 
gCO2 is CO2 emission growth 
gEgim is net energy import growth 
gTaxcredit is tax credit growth 
gPelectricity is electricity prices inflation 
gGDP is GDP growth
<table>
<thead>
<tr>
<th></th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coal Prices</strong></td>
<td>2.63(4.31)</td>
<td>-.734(1.09)</td>
<td>-.457(5.18)</td>
<td>1.73(2.67)</td>
</tr>
<tr>
<td><strong>CO2</strong></td>
<td>-.00018(.0003)</td>
<td>.00015(.00003)**</td>
<td>-.169(.550)</td>
<td>-.163(.304)</td>
</tr>
<tr>
<td><strong>Net Energy Import</strong></td>
<td>-9.35(13.77)</td>
<td>-7.22 (1.92)**</td>
<td>-16.58(14.58)</td>
<td>-24.04(8.03)**</td>
</tr>
<tr>
<td><strong>Crude Oil Prices</strong></td>
<td>.599 (.851)</td>
<td>.107 (.226)</td>
<td>.994(1.154)</td>
<td>.756(.57)</td>
</tr>
<tr>
<td><strong>Tax Credit</strong></td>
<td>2.67 (12.90)</td>
<td>2.51 (1.30)**</td>
<td>14.08(8.0570)*</td>
<td>34.94(4.58)**</td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td>-.024 (.053)</td>
<td>-.006(.033)</td>
<td>.0609(.032)*</td>
<td>.113(.0185)**</td>
</tr>
<tr>
<td><strong>Electricity Prices</strong></td>
<td>11.29 (57.38)</td>
<td>-1.32(2.49)</td>
<td>-20.94(10.060)**</td>
<td>.383(2.707)</td>
</tr>
<tr>
<td><strong>Gas Prices</strong></td>
<td>.791 (2.42)</td>
<td>.242 (.571)</td>
<td>3.095(1.79)*</td>
<td>.559(.884)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>1555.3 (1469.06)</td>
<td>-379.07(198.7)*</td>
<td>3620.48(875.43)**</td>
<td>-651.16(399.78)*</td>
</tr>
</tbody>
</table>

***Significant at or below 1 percent.
**Significant at or below 5 percent.
*Significant at or below 10 percent.
Conclusion & Policies

Tax credit to renewable energy development, leads to a higher level of renewable energy consumption (commercial, industrial, and transportation consumption).

Federal government in the United States is advised to continue to subsidize development and redistribution the subsites to cover the household consumption.
Thank You

Questions!