



# **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

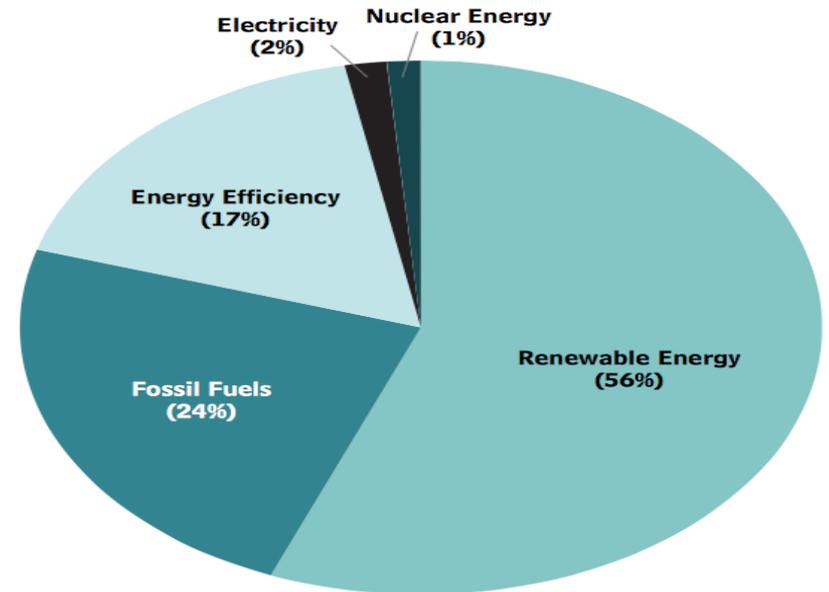


# Introduction

- 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.



**Total: \$15.8 Billion**



# Introduction

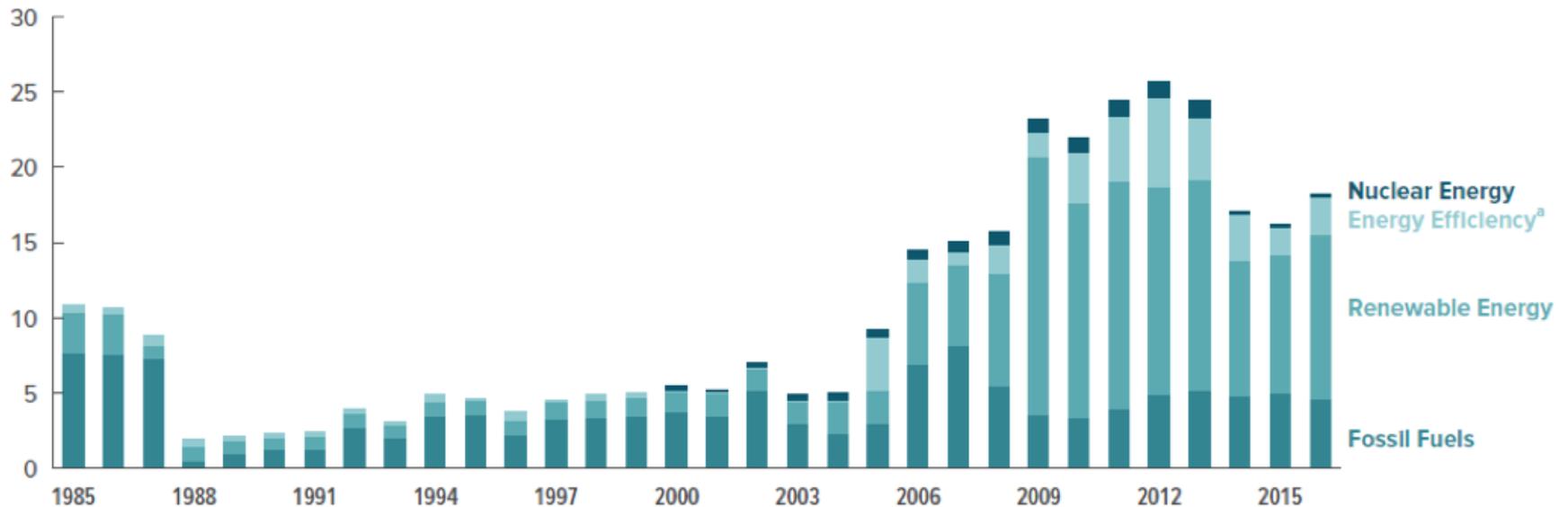
Tax Preferences, by Type of Fuel or Technology, 1985 to 2016.

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.

Billions of 2016 Dollars



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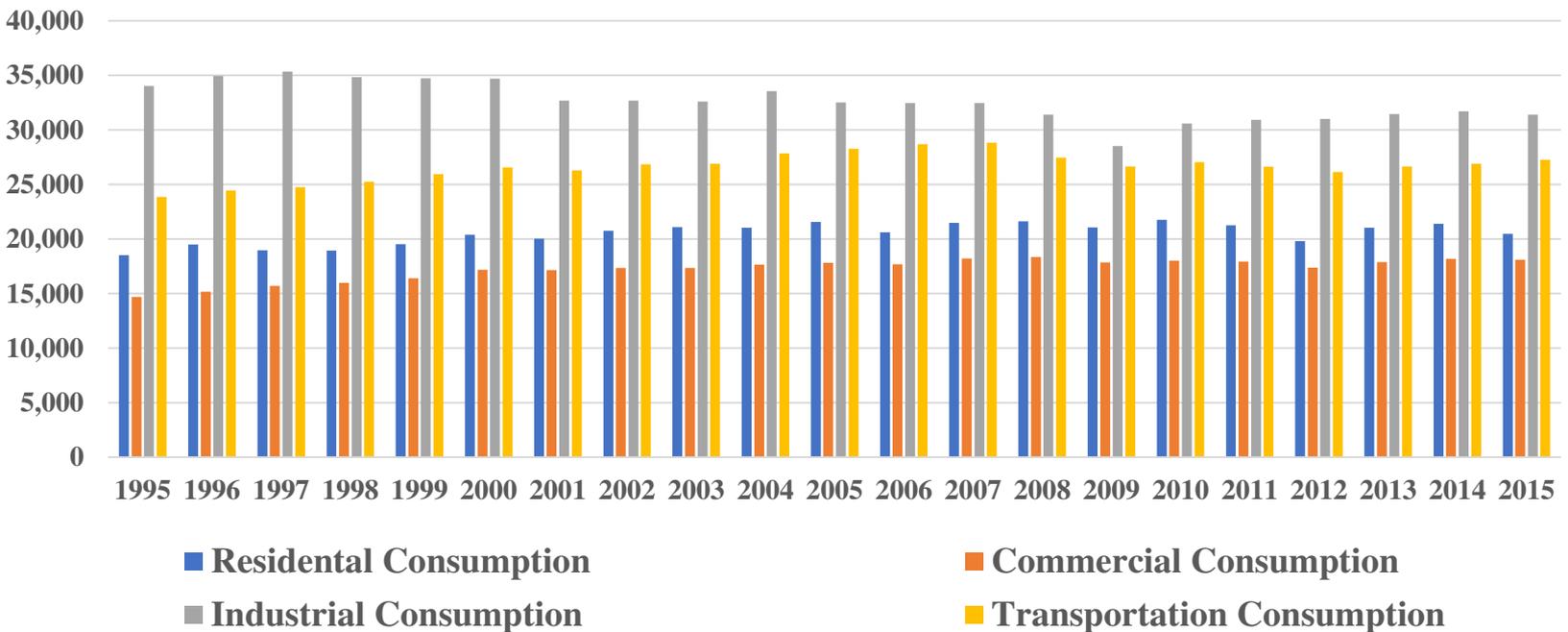
# Contributions

- 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)



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# 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 .



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# Methodology

$$gCRE_{it} = \beta_0 + \beta_1 gPoil_t + \beta_2 gPgas_{it} + \beta_3 gPcoal_t + \beta_4 gCO2_t + \beta_5 gEgim_t + \beta_6 gTaxcredit_t + \beta_7 gPelectricity_t + \beta_8 gGDP + \varepsilon_t$$

Subscript  $t = 1985, \dots, 2015$  indicates the time period.  $\varepsilon$  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



# Table1 Empirical Results

	Residential	Commercial	Industrial	Transportation
Coal Prices	2.63(4.31)	-.734(1.09)	-.457(5.18)	1.73(2.67)
CO2	-.00018(.0003)	.00015(.00003)***	-.169(.550)	-.163(.304)
Net Energy Import	-9.35(13.77)	-7.22 (1.92)***	-16.58(14.58)	-24.04(8.03)***
Crude Oil Prices	.599 (.851)	.107 (.226)	.994(1.154)	.756(.57)
Tax Credit	2.67 (12.90)	2.51 (1.30)*	14.08(8.0570)*	34.94(4.58)***
GDP	-.024 (.053)	-.006(.033)	.0609(.032)*	.113(.0185)***
Electricity Prices	11.29 (57.38)	-1.32(2.49)	-20.94(10.060)**	.383(2.707)
Gas Prices	.791 (2.42)	.242 (.571)	3.095(1.79)*	.559(.884)
Constant	1555.3 (1469.06)	-379.07(198.7)*	3620.48(875.43)***	-651.16(399.78)*

\*\*\*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 and re distribution the subsites to cover the household consumption.



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Thank You  
Questions!