

The Decarbonization Revenue Calculator

A Spreadsheet by Charles Komanoff

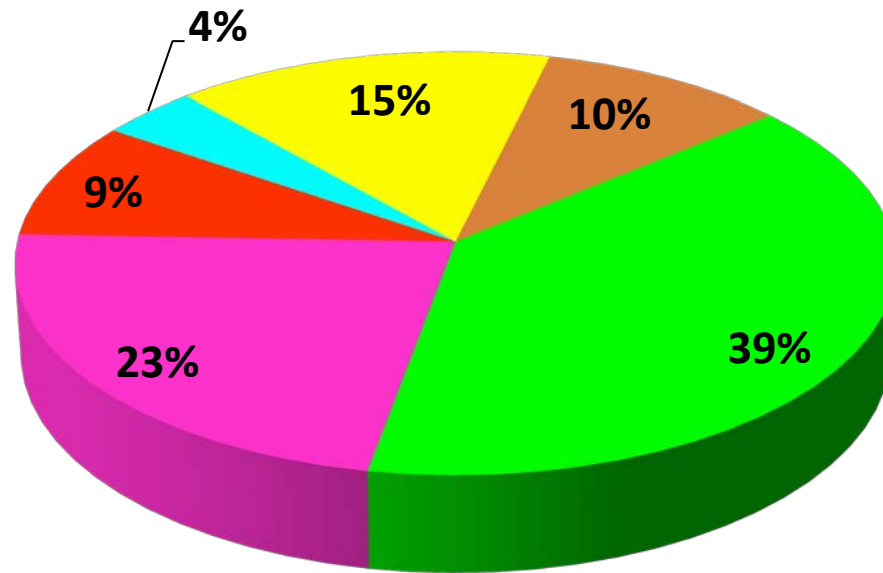
Carbon Tax Center

May 29, 2013

www.carbontax.org • www.komanoff.net

U.S. Economy Divided into Six Sectors

U.S. CO2 Emissions, 2012



■ Electricity

■ Personal Ground Travel

■ Goods Movement

■ Aviation

■ Other Petroleum

■ Other Methane

Modeler's Inputs

- **Tax Start Year**
- **Initial Rate (\$/ton CO₂) — economy-wide**
 - Annual Increment by Constant Amount?
 - How Much?
- **Annual Increment by Constant Percent?**
 - How Much?
- **Are Tax Increments in Real or Nominal \$?**
- **Surtax on Petroleum Products?**
 - Which?
 - How large?

Elasticities Drive Sectoral Demand and Carbon Content

- **Demand Side Price-Elasticities**
(Negative) 0.4 – 0.7
- **Demand Side: Income-Elasticities**
(Positive) 0.5 – 1.0
- **Supply Side: Degree to which \$100/ton CO2 tax will reduce per-unit emissions**
Electricity: ongoing decline magnified 3-4X
Personal Ground Travel: 10% reduction
- **User May Vary**

Results

- **CO2: by Sector and Overall**
- **Revenue: Nationally and by Household (with and without deficit reduction)**
- **Oil: by Sector and Overall**

Larson Carbon Tax

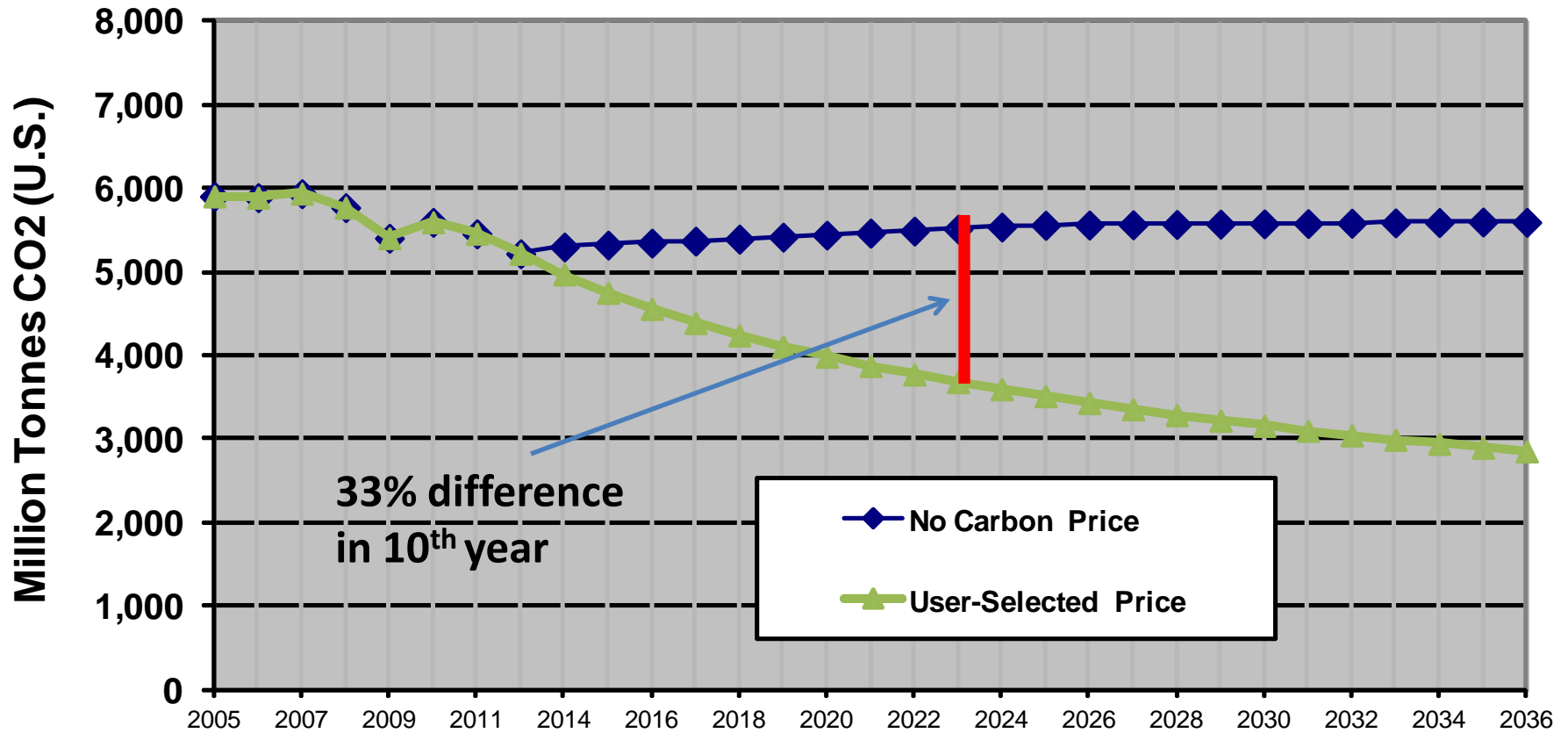
(Rep. John B. Larson, D-CT)

“AESTFA” • 2009

- Initial Year: \$15/ton CO₂
- Subsequent Yrs: \$10-15/ton
(we model as \$12.50/ton increments)

Larson Carbon Tax

CO2 Emissions with Carbon Tax and without

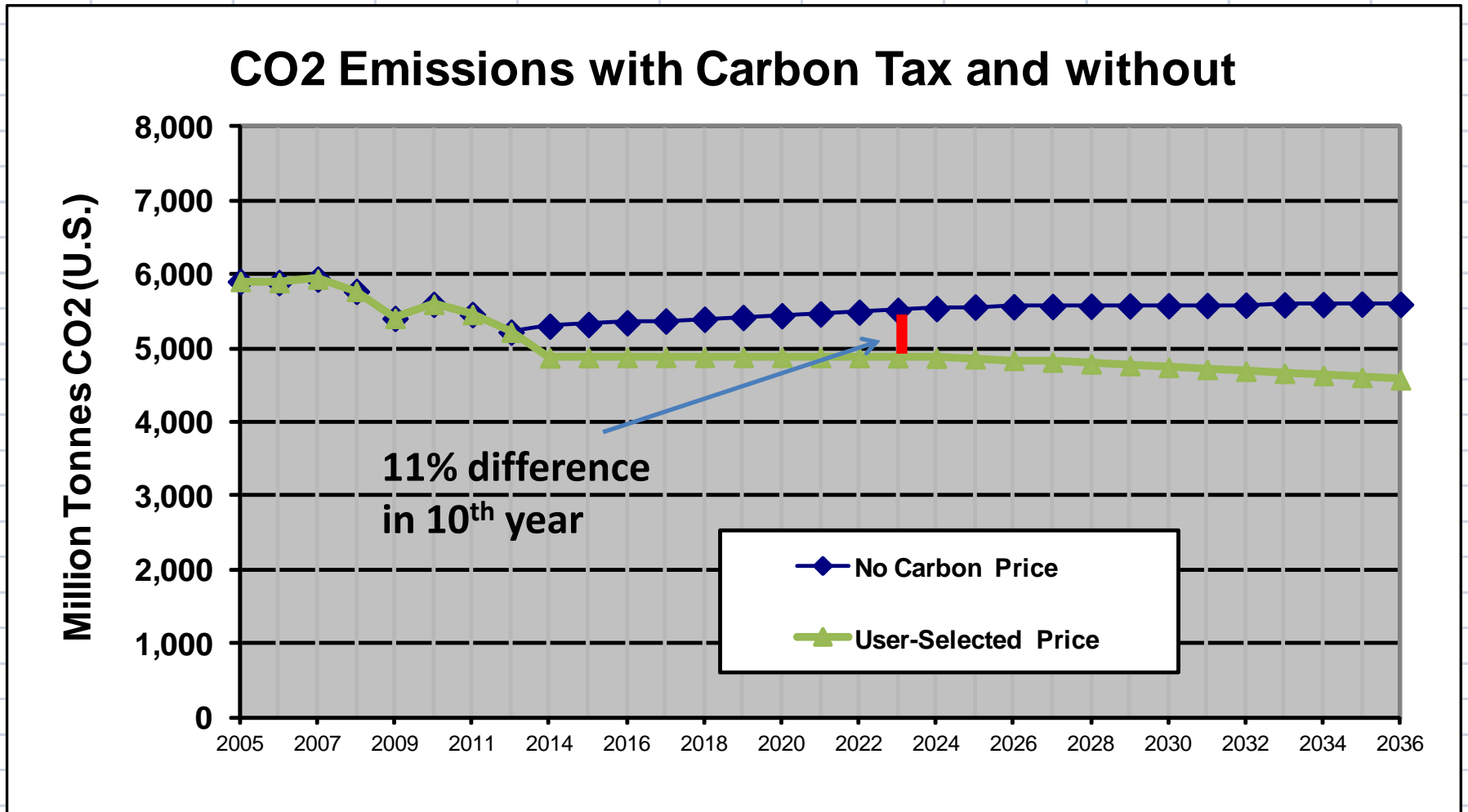


Sanders-Boxer Carbon Tax

(Senators Bernie Sanders, D-VT
& Barbara Boxer, D-CA)

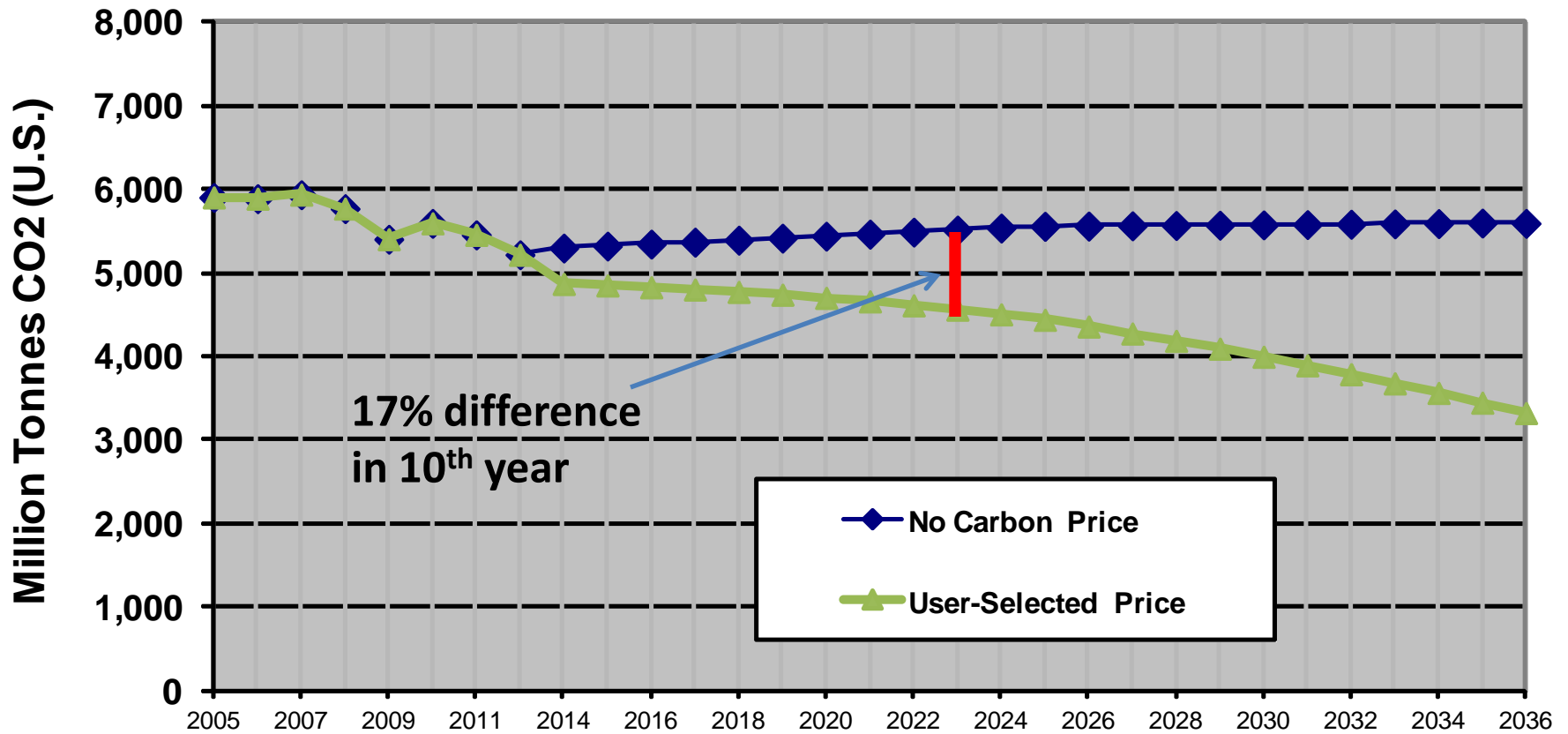
- Initial Year: \$20/ton CO₂
- Subsequent Yrs: Rise 5.6%/annum
- Analyzed by CBO (2011)

Sanders-Boxer Carbon Tax



Sanders-Boxer w/ 2x p.a. %

CO2 Emissions with Carbon Tax and without



Larson Tax: Sectoral Analysis

U.S. CO2 Emissions in Carbon Tax's 10th Year, by Sector

3,000

2,000

1,000

000,000
tonnes

- CO2 Reductions from No-tax Trajectory
- CO2 Emissions with Carbon Tax

Electricity

Personal
Ground
Travel

Freight

Aviation

"Other"
Petroleum

"Other"
Methane

1,085

963

220

1,052

97

388

31

183

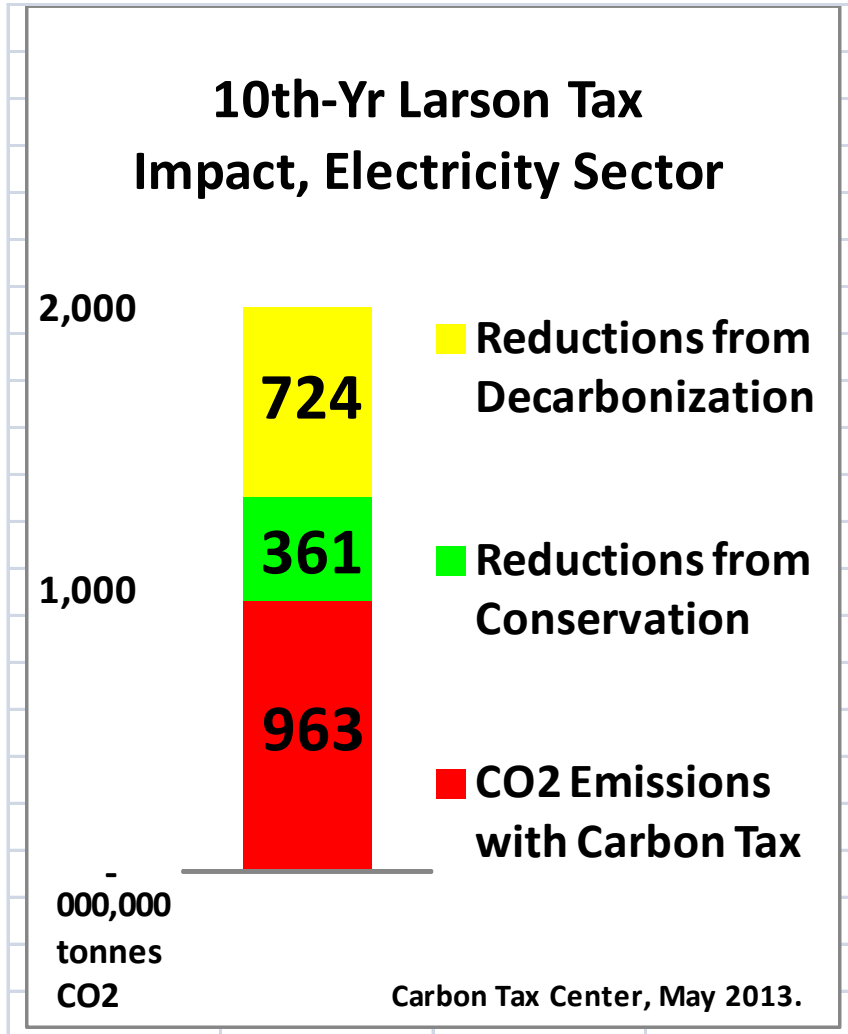
162

667

212

431

Electricity Sector: Demand Side

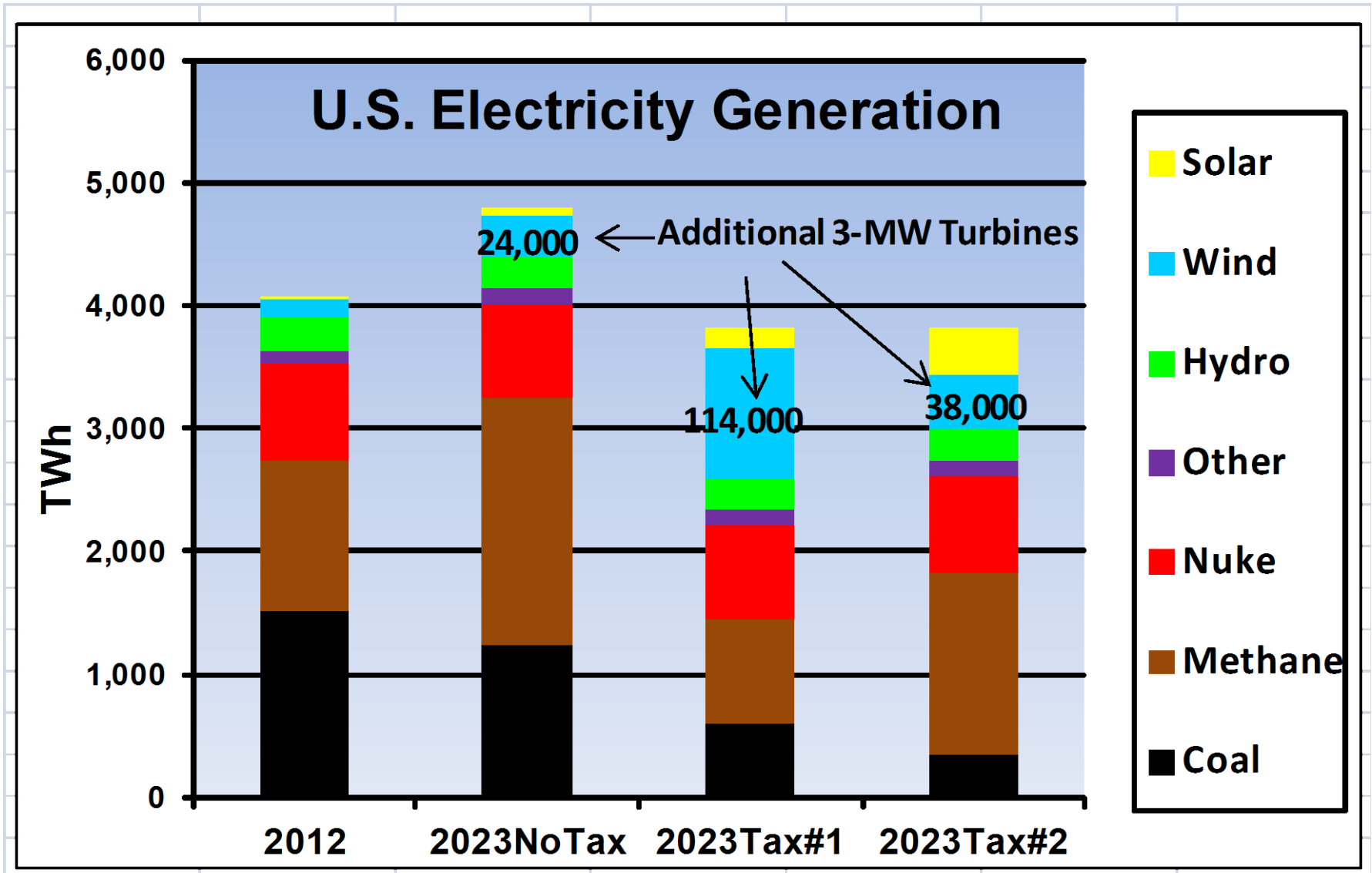


Compound Growth to 2023

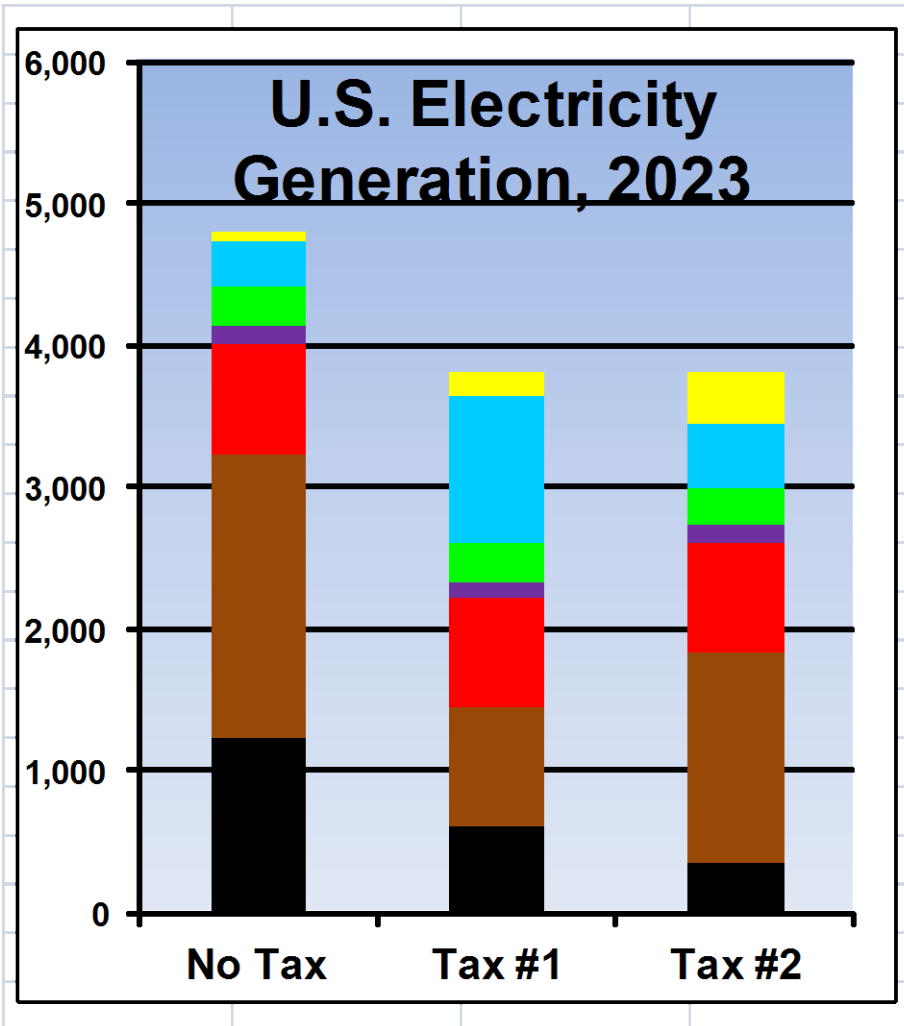
	No Tax	Larson	Impact
TWh	1.5%	-0.6%	-2.1%
¢/kWh	1.3%	4.4%	3.0%
2012¢/kWh	-0.4%	2.6%	3.0%
Bills	2.9%	3.8%	0.9%
2012\$ Bills	1.1%	2.0%	0.9%

Conclusion: Impact on bills is slight (easily covered by dividends or tax swaps).

Larson Tax: Electricity Sector



Growth in Renewables to Meet Larson "Targets" for 2023



Compound Growth Rates 2012-2023

No Tax

Wind: 8% • Solar: 28%

Tax #1

Wind : 20% • Solar: 40%

Tax #2

Wind: 11% • Solar: 50%

Carbon Tax Revenues (Larson Bill)

