Calculations to estimate Missouri's need for renewables

To estimate the total amount of renewable energy needed for Missouri to meet its 2021 Renewable Energy Standard (RES) target, I first estimated the total 2021 electricity demand (A). This estimate was based on 2012 sales[1] that were increased according to the projected increase in electricity demand for the Missouri region.[2] Missouri's RES only applies to investor-own utilities, who according to the most recent EIA data, account for about 70 percent of the state's retail sales (B). The result is that 62 million MWh of 2021 electric demand is subject to the RES (C). In order for 15% of this future demand to be met with renewables, Missouri will need 9 million MWh of renewable energy supply (E)

89	A: Projected 2021 Missouri electric retail sales (million MWh)
70%	B: Percentage of Misouri electric sales that are subject to the RES
62	C = A x B: 2021 electric retails sales that are subject to the RES (million MWh)
15%	D: Renewable Electricity Standard 2021 requirement
9	E = C x D: Missouri's 2021 need for renewables (million MWh)

[1] EIA Detailed State Data. "Retail Sales of Electricity by State by Sector by Provider." Available online at http://www.eia.gov/electricity/data/state/. (Last accessed on February 7, 2014).

[2] EIA 2014 Annual Energy Outlook. "Electric Power Projections for Electricity Market Module Regions." Available online at http://www.eia.gov/forecasts/aeo/er/tables_ref.cfm. (Last accessed on February 28, 2014).

EIA Detailed State Data. "Retail Electricity Sales Statistics, 2010." Available online at http://www.eia.gov/electricity/state/missouri/index.cfm. (Last accessed on February 28, 2014).

Calculations to estimate Missouri's current renewables supply

To determine Missouri's current renewables supply for RES compliance, I reviewed the 2012 RES Compliance Reports for Ameren Missouri, Empire District Electric Company, Kansas City Power & Light and KCP&L Greater Missouri Operations Company.[3] For the hydroelectric, solar and landfill methane sources, I used the reported amounts of generation. For the wind sources, since some of the generation totals were excluded or redacted, I multiplied the wind farm's nameplate capacity by an estimated capacity factor (38% for Iowa wind farms and 40% for Kansas wind farms). I then summed the generation from each of these existing sources to find a total of 4.17 million MWh of current renewables supply.

Utility	Plant	Type	Generation (MWh)
Ameren Missouri	Keokuk Hydro-electric Generation Station	Hydro	754,125
Ameren Missouri	Pioneer Prairie Wind Farm I	Wind	340,769
Ameren Missouri	Ameren Missouri Headquarters	Solar	104
Ameren Missouri	Maryland Heights Renewable Energy Center	Landfill	37,450
Ameren Missouri	S-REC Purchase from Customers	Solar	2,851
Empire District Electric Company	Elk River Wind Farm	Wind	525,960
Empire District Electric Company	Meridian Way	Wind	368,172
Empire District Electric Company	Ozark Beach Hydroelectric Project	Hydro	57,806
KCP&L Greater Missouri Operations Company	Gray County Wind Farm	Wind	393,418
KCP&L Greater Missouri Operations Company	Ensign Wind	Wind	346,783
KCP&L Greater Missouri Operations Company	St. Joseph Landfill Gas	Landfill	3,000
KCP&L Greater Missouri Operations Company	S-REC Purchase from 3Degrees Group	Solar	3,600
Kansas City Power & Light Company	Spearville I Wind Farm	Wind	352,393
Kansas City Power & Light Company	Spearville II Wind Farm	Wind	168,307
Kansas City Power & Light Company	Paseo Solar	Solar	95
Kansas City Power & Light Company	Spearville 3	Wind	353,445
Kansas City Power & Light Company	Cimarron	Wind	459,338
Kansas City Power & Light Company	S-REC Purchase from 3Degrees Group	Solar	3,900
		Total	**4,171,517**

[3]Missouri Public Service Commission. "Renewable Energy Standard Compliance Reports." Available online at http://psc.mo.gov/electric/Renewable_Energy_Standard_Compliance_Reports. (Last accessed February 28, 2014).