



MEMORANDUM Environmental Division

To: Jay Leipzig, AICP, Director,
Sean Pendley, AICP, Deputy Director
Karen Miller, Planner
Planning, Housing, & Community Development, Johnson County, KS

From: Darren Coffey, AICP, Director of Strategic Partnerships/Owner
Michael Zehner, AICP, ENV SP, Environmental Programs Director
Lindsay Edwards, ENV SP, Environmental Planner

Date: June 2, 2022

Subject: Comparable Solar Projects

Background and Purpose

As requested, in preparation for the scheduled June 6, 2022 Board of County Commissioners ("BOCC") meeting to consider amendments of the County's Zoning Ordinance for solar facilities, and based upon the County's consideration to limiting the maximum project area of such facilities to 1,000 acres or 2,000 acres, we are providing the County with an update to our memorandum dated February 22, 2022. In that memorandum, as originally requested, we presented information on solar projects similar in size to those anticipated in Johnson County, and located within an urbanizing county similar to Johnson County, and concluded that the "1,000-acre maximum project area [as previously recommended] is suitable given the density of Johnson County and potential for additional growth." **At that time, the 1,000-acre maximum project area was the focus of our conclusion because that was then the recommendation of the County's Planning Commission; however, this memorandum intends to consider the suitability of projects with areas upwards of 2,000 acres, which was recently put forth for further consideration as part of a recent BOCC remand on April 4, 2022, as well as other related considerations.**

Identifying Counties for Comparison

In the previous memorandum we identified counties with populations similar to that of Johnson County, identifying 48 counties of a similar size, ranging in population between approximately 500,000 and 700,000. However, our conclusions noted that upon further review of projects and locations, the significant variation in both populations and county area became apparent, and that it would be necessary to take population density into account to determine true comparable communities. With this in mind, **we were able to identify 22 counties that had land area, total population, and population density within a range comparable to Johnson County. Table 1, below, includes this**

information, ordered based upon population density, and highlighting Johnson County for comparison. Additionally, information for Douglas County, Kansas has been included, as the County’s pending regulations have been compared to those recently adopted by the adjacent county; further, information for Travis County, Texas has been included, as the prior memo identified that county as “perhaps the best and only comparable” when considering population density and based upon the identified utility-scale solar project in that county. It is important to note that while Douglas County is comparable in area, it has a significantly smaller population and population density, and while Travis County has a comparable population density, it has a significantly larger total population and is significantly larger in area.

TABLE 1: COUNTIES COMPARABLE TO JOHNSON COUNTY, KANSAS

Land Area (sq. miles)	County	State	Largest City/Town; Metropolitan Statistical Area	Total Population	Population Density (persons per sq. mile)
409.49 ¹	Providence County	Rhode Island	Providence; Providence-Warwick, RI-MA	634,533	1,549.58
624.96	Fairfield County	Connecticut	Bridgeport; Bridgeport-Stamford-Norwalk-Danbury	944,348	1,511.04
309.40	Seminole County	Florida	Sanford; Orlando-Kissimmee-Sanford	455,086	1,470.86
604.52 ¹	New Haven County	Connecticut	New Haven; New Haven-Milford, CT	859,339	1,421.53
598.36	Baltimore County	Maryland	NA; Baltimore-Columbia-Towson	827,625	1,383.16
414.78	Anne Arundel County	Maryland	Annapolis; Baltimore-Columbia-Towson	567,696	1,368.65
335.74 ¹	Prince William County	Virginia	Dumfries; Washington	456,749	1,360.42
503.49	Davidson County	Tennessee	Nashville; Nashville-Davidson–Murfreesboro–Franklin	684,017	1,358.55
468.17 ¹	Monmouth County	New Jersey	Middletown Township; New York	623,387	1,331.53
412.81	Summit County	Ohio	Akron; Akron	541,810	1,312.48
426.31 ¹	New Castle County	Delaware	Wilmington; Philadelphia-Camden-Wilmington	555,133	1,302.17
340.71	Lucas County	Ohio	Toledo; Toledo	432,379	1,269.05
473.61	Johnson County	Kansas	Overland Park; Kansas City	585,502	1,236.25
991.85 ²	Travis County	Texas	Austin; Austin–Round Rock-Georgetown	1,203,166	1,213.05
461.49	Montgomery County	Ohio	Dayton; Dayton	532,034	1,152.86

**The Berkley Group - Memorandum
Comparable Solar Projects - Johnson County, KS
June 2, 2022**

604.52¹	Jackson County	Missouri	Kansas City; Kansas City	692,003	1,144.72
299.04	Davis County	Utah	Layton; Ogden-Clearfield	340,621	1,139.06
656.87	Monroe County	New York	Rochester; Rochester	744,248	1,133.02
570.32	Tulsa County	Oklahoma	Tulsa; Tulsa	642,781	1,127.05
708.82	Oklahoma County	Oklahoma	Oklahoma City; Oklahoma City	782,051	1,103.31
301.86	Somerset County	New Jersey	Franklin Township; New York	330,176	1,093.80
460.56¹	Morris County	New Jersey	Parsippany-Troy Hills Township; New York	494,383	1,073.43
345.20	Lehigh County	Pennsylvania	Allentown; Allentown–Bethlehem–Easton	362,613	1,050.43
604.43	Bucks County	Pennsylvania	Bensalem; Philadelphia–Camden–Wilmington	626,370	1,036.30
455.76³	Douglas County	Kansas	Lawrence; Lawrence	119,319	261.8

¹ These 7 counties are also listed in Table 2 and are comparable to Johnson County with regard to population, land area and population density.

² Travis County is included in this table because it was identified by the prior memo as the best comparable county when considering population density and its 932-acre solar facility.

³ Though Douglas County's population/population density are significantly smaller than Johnson County's, it is included in this table because it is adjacent to Johnson County, under consideration for a solar facility, and has recently adopted solar regulations.

Identifying Comparable Solar Facilities

With regard to comparable solar facilities, as noted in the previous memorandum, the potential NextEra Energy project (West Gardner Solar Project) could have a project area totaling 3,000 acres (in both Johnson and Douglas counties). Additionally, the County is considering a maximum project area limit of either 2,000 or 1,000 acres. Based upon this, Berkley Group (“BG”) Staff previously identified similarly sized projects on sites with areas between approximately 1,000 acres and 2,000 acres; additionally, BG Staff previously identified solar facilities in counties with comparable populations, noting projects in Ocean County, New Jersey; Brevard County, Florida; and Volusia County, Florida. However, as noted above, given variations in populations and county area, it was important to also consider population density to identify comparisons. **Therefore, BG Staff has revised Table 2, below, to include population density, and to list projects identified within the comparable counties identified above (projects greater than 100 acres in size).**

From the comparable counties listed in Table 1, only six (6) solar facilities were identified. These six solar facilities are all 500 acres or less in size and are located in New Castle County, DE; Prince William County, VA; Providence County, RI;

Monmouth County, NJ; New Haven County, CT; and Morris County, NJ. Based upon reports for a potential 2,000-acre solar project at KCI Airport, a hypothetical project is listed for Jackson County, Missouri. Additionally, a hypothetical 1,000-acre project is listed for Douglas County. For Douglas County it is important to note that the newly adopted regulations limit site area to a maximum of 1,000 acres (with a waiver available subject to conditions), but site area is only defined as the footprint of the solar area containing the solar modules and is not equivalent to the definition and regulation of Project Area as contained in the proposed Johnson County regulations. It is likely that the project area (measured as defined under the Johnson County regulations) of a facility in Douglas County with a defined site area of 1,000 acres would be at least 1,500 acres or more in total area.

Table 2: COMPARING SOLAR FACILITY SIZE WITH COUNTY POPULATION, AREA & POPULATION DENSITY

Facility Name	Project Area (approx.)	Location	County Populations	County Area	Population Density (persons per sq. mile)
Garland Solar Facility	2,000 acres	Kern County, CA	901,362	8,163 sq. miles	110.42
GA Solar 4 Project	2,000 acres	Twiggs County, CA	8,103	363 sq. miles	22.32
Moapa Southern Paiute	2,000 acres	Clark County, NV	2,315,963	8,061 sq. miles	287.3
TBD - Hypothetical	2,000 acres	Johnson County, KS	585,502	474 sq. miles	1236.25
KCI Airport Solar¹ - Hypothetical	2,000 acres	Jackson County, MO	692,003	605 sq. miles	1144.72
California Valley Solar Ranch	1,966 acres	San Luis Obispo County, CA	282,249	3,299 sq. miles	85.55
Tranquility Solar Project	1,900 acres	Fresno County, CA	1,000,918	6,011 sq. miles	166.51
Lund Hill Solar	1,800 acres	Klickitat County, WA	22,697	1,904 sq. miles	11.92
Stateline Solar	1,685 acres	San Bernardino County, CA	2,189,183	20,105 sq. miles	108.88
Great Valley Solar	1,600 acres	Fresno County, CA	1,000,918	6,011 sq. miles	16.78

**The Berkley Group - Memorandum
Comparable Solar Projects - Johnson County, KS
June 2, 2022**

Springbok Solar Farm	1,400 acres	Kern County, CA	901,362	8,163 sq. miles	110.42
Madison Fields Solar Project	1,000 acres	Madison County, OH	44,559	467 sq. miles	95.42
TBD – Hypothetical²	1,000 acres	Douglas County, KS	119,319	456 sq. miles	261.8
TBD - Hypothetical	1,000 acres	Johnson County, KS	585,502	474 sq. miles	1236.25
Pflugerville/East Blackland Solar Project	932 acres	Travis County, TX	1,203,166	992 sq. miles	1213.05
Toms River Merchant Solar	800 acres	Ocean County, NJ	614,237	915 sq. miles	671.29
Palm Bay Solar Energy Center	485 acres	Brevard County, FL	608,459	1,557 sq. miles	390.78
DeBary Solar Power Plant	445 acres	Volusia County, FL	561,497	1,432 sq. miles	392.1
Cedar Creek³	500 acres	New Castle County, DE	555,133	426 sq. miles	1302.17
Nokesville Solar³	331 acres	Prince William County, VA	456,749	336 sq. miles	1360.42
ENGIE – Solidago³	276	New Castle County, DE	555,133	426 sq. miles	1302.17
King Community Solar Project³	200 acres	Providence County, RI	634,533	409 sq. miles	1549.58
Ben Moreell Solar Farm³	170 acres	Monmouth County, NJ	623,387	468 sq. miles	1331.53
Wallingford Solar³	130 acres	New Haven County, CT	859,339	605 sq. miles	1421.53
Mount Olive Solar Farm³	102 acres	Morris County, NJ	494,383	461 sq. miles	1073.43

¹ Based upon news media reports of a possible 2,000-acre solar facility considered for the KCI Airport, Jackson County, Missouri is included in this Table.

² Though Douglas County's population/population density are significantly smaller than Johnson County's, it is included in this table because it is adjacent to Johnson County, under consideration for a solar facility, and has recently adopted solar regulations.

³ These 6 counties, along with Jackson County, Missouri, are carried over from Table 1 and are comparable to Johnson County with regard to population, land area and population density.

Conclusions

As a result of this additional review, BG Staff has not identified existing or under-development solar facilities at the scale being considered by Johnson County existing in counties identified as having comparable areas, populations, and population densities. **Based upon comparable population density alone, Travis County, Texas and the Pflugerville/East Blackland Solar Project, with a project area of 932 acres, remains the closest comparable. However, the potential 2,000-acre project at KCI Airport would be comparable to the size of projects anticipated by the regulations being considered by Johnson County.**

Considering Unique Conditions

This review of comparable communities did not take into account the presence of unique use/reuse sites that may be located in the localities, or unique land development conditions. However, much like excess property at KCI Airport that may otherwise be unsuitable for traditional development, at least one area exists in Johnson County, and possibly more, that has the potential to be leveraged for the development of a sizeable solar facility. Portions of the former Sunflower Ammunition Plant site present a similar opportunity for the development of a solar facility upwards of 2,000 acres. This is similarly true for the development pattern of Johnson County; while there is density within the County, and the County is urbanizing, there are also rural areas that are less dense and located a sufficient distance from denser and more developed/developing city fringe areas to support projects of at least 1,000 acres in size, and perhaps up to 2,000 acres in size. Additionally, there are other development standards, such as maximum panel coverage, setbacks and screening, which will affect the overall impact of a solar project.

Ultimately, given that there are areas of the County that are potentially appropriate for project areas greater than 1,000 acres, it's a policy decision as to whether: 1) a maximum project area of 1,000 acres with an associated waiver, 2) a maximum project area of 2,000 acres with or without an associated waiver, or 3) some other alternative is the most appropriate approach for regulating project area in Johnson County, Kansas.