PV Panels

It has been determined that to reach Net Zero Energy using strictly PV Panels a total output from panels will need to be 721 MWh. A portion of this production will be carried by panels located on the new building roof with the remainder of the need being contributed by panels over the Parking fields. This means that approximately 500 kW DC must be generated from Parking PV canopies (representing 632,000kWh/yr).

By maximizing canopies over parking stalls only and leaving drive aisles open a total of 27,200 sf area of canopy can be achieved.

Therefore, to reach the desired level of production, panels must be highly efficient and produce 545-580 kW per panel as opposed to a more common panel generating 350-450 kW per panel.

See the PV Panel **Basis of Design: ClearSpan Module System** Spec Sheet included as **Appendix B** in this report. A proposed layout is shown below.

Canopies

A number of Manufacturers were studied/contacted as research in support of this project. A **Comparative Listing** of several manufacturers is included at the end of this report as **Appendix A**.

Highlighted with a Red Box is the **Basis of Design: Lumos Solar**.

They provide turn-key installation including canopy engineering, procurement of PV panels and the installation of both. They are able to install foundations for the canopies in conjunction with the project schedule's intent to pave the parking areas late summer 2024. To date, their information has been timely, informative and consistent.

They are US based and thus their products for both canopies and panels may qualify for current Federal Solar Tax Credits (also known as Federal 40% ITC Direct Pay rebates), see section below for more information on this program.

Federal Credit Programs

The following is information on current Federal Solar Tax Credits for Businesses also known as Rebate Programs. Note that "ITC" refers to a category titled "Investment Tax Credit". County Staff should confirm eligibility.

STRUCTURES AND BUILDING-INTEGRATED PV

Structures holding the solar PV system may be eligible for the ITC if the solar PV system is designed with the primary goal of electricity generation and other uses of the structure are merely incidental. [12] Though structural components typically do not qualify for the ITC, the IRS noted an exception for components "so specifically engineered that it is in essence part of the machinery or equipment with which it functions."[13] Therefore, building-integrated PV, like solar windows, shingles, or facades, which provide a dual function are eligible for the ITC.

The initial rebate level is 30% of installed cost of canopies with PV (including the cost of the PV panels). This level rises to 40% if the canopies and PV are of domestic content.

Given the County's Tax-Exempt status, the rebate can come as a "direct pay". Forms will be required, but those eligible include the following:

Tax-exempt organizations (i.e. non-profits), states, counties, municipalities, instrumentalities (like school districts), the Tennessee Valley Authority, Indian Tribal governments, any Alaskan Native Corporation, and any rural electric cooperative can receive a refund from the IRS for tax credits on projects placed in service after 2022.[27] Partnerships, even if all the partners are eligible, are not allowed, but certain ownership arrangements such as a tenancy-in-common are allowed.[28]

Organizations that wish to receive direct pay, also known as elective pay, must pre-register with the IRS before the tax return is due and receive a registration number. [29] More information about the electronic pre-filing registration process will be available when the process is launched later in 2023, including advice for filers without internet access. Registration is required every year for each applicable property, i.e., for every year of the PTC, however pre-registration does not confirm eligibility.

EV Charging

It is the County's intent to provide (3) Level 2 Dual EV Chargers as part of this project. The exact locations of the Chargers are yet to be determined.

There may be Zoning requirements if the chargers are provided for public use.

Additionally, how these Chargers are funded (User Pay, etc.) is also yet to be determined.

V. APPENDIX A

Comparison Study

PREMANUFACTURED SOLAR CANOPIES FOR PARKING

Solar Electric Supply carries Orion, Upsolar, and Schletter pre-fabricated carports

Company	Orion	Upsolar	Schletter	Lumos	Kern Solar	Solar Mounts
Product	Leto	UP-M290P modules mounted to structures	Park@Sol	SolarScapes	Vista or Summit (PV panels separate)	Solar Carport (PV separate)
Design	Double column, single cantilever	Dbl cantilever flush, dbl cantilever tilted, full cantilever flush	See photo below, trapezoidal on heavy concrete foundation weights	Two support design options in forms below	Double cantilever with single column on conc. pile with embedded column	Y, T, or L frame (below specs are T frame) on concrete pier & I-beam
Spacing	18-foot span		Up to 16-foot span	Std column spacing up to 20'	18'-32'	26'-27'
Tilt options	0°, 5°, 10°	Module array up to 20°		Std 7° tilt	2°, 5°, or 7°	7° standard
Depth	Site specific		13.5 m (44.3 feet)	Array depth 6'-60'	Up to 40'	38'-53'
Materials	Steel		Aluminum sheet metal	Aluminum or steel	Steel and aluminum	Galvanized steel
Colors	Primed or hot dip galvanized			Powder coated 50 std colors	Custom colors and steel finishes, range of coatings	
Lighting	available			Outdoor rated LED lighting option	LED backlighting and area lighting	Not included
EV Charging	available		P-CHARGE incorporated into base		EVRaX Charging Stations	Not included
Website	www.orioncarports.com	Website blocked – info via Solar Electric www.solarelectricsupply.com	German company – info via Solar Electric	www.lumossolar.com	www.kernsolarstructures.com	www.solarmounts.com
	Information Based on Website Only			Information Based on Direct contact with Manufacturer	Information Based on Website Only	Information Based on Direct contact with Manufacturer
				BASIS OF DESIGN		

Lumos Solar product examples