

# Hardin Solar III Energy Center

Virtual Public Information Meeting

January 5, 2021



# Agenda

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- **Invenergy Introduction**
- **Description of Project**
- **Project Schedule**
- **Project Components and Facilities**
- **Project Map**
- **Project Studies**
- **Community Engagement & Impacts**
- **Ohio Power Siting Board Review and Certification Process**
- **Contact Information**
- **Q&A**

# Invenergy Introduction

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# Team Introduction

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- **Development**

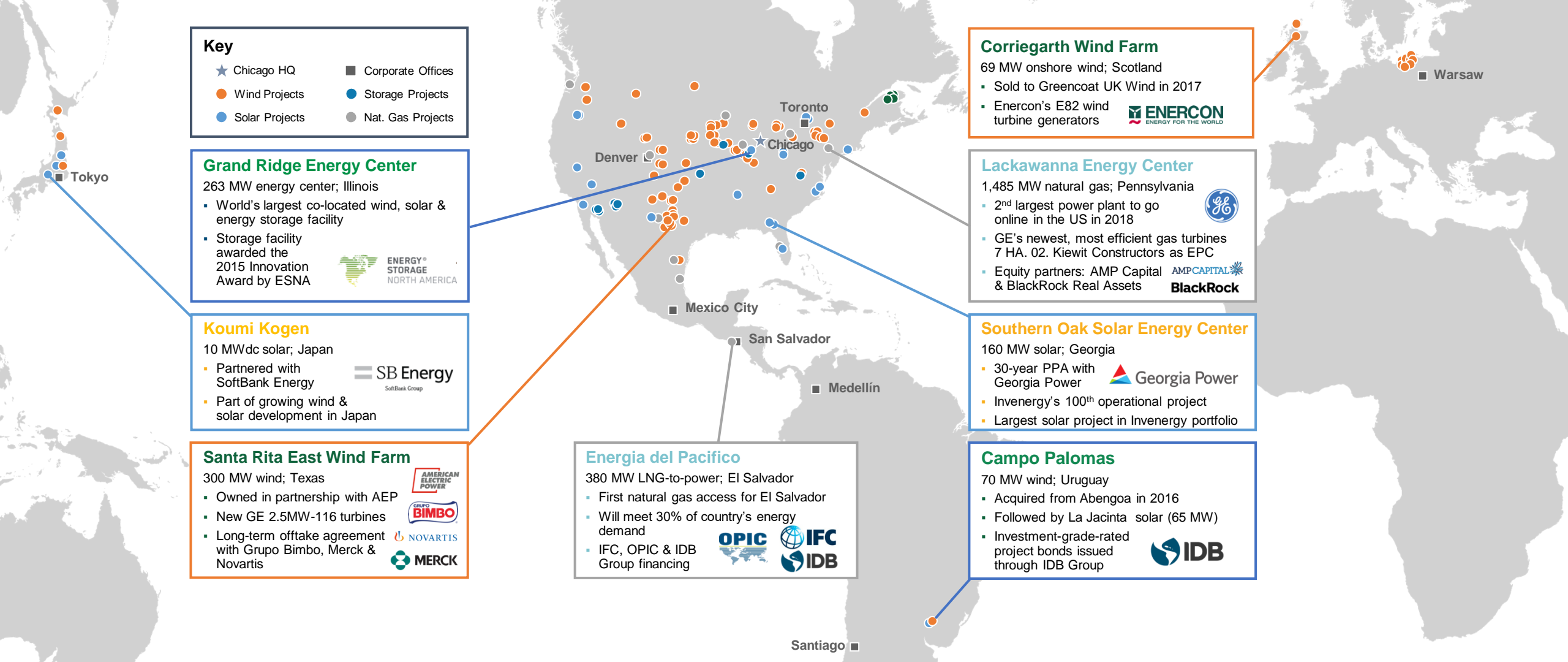
- Michael Kaplan – Vice President, Renewable Development
- Ryan Van Portfliet – Manager, Renewable Development (Ohio Lead)
- Erin Saal – Senior Analyst, Renewable Development (Project Lead)

- **Environmental Compliance and Strategy**

- Brad Romano – Senior Manager, Environmental Compliance and Strategy

- **Engineering**

- Emily Paice – Senior Manager, Renewable Engineering
- Sean Fallon – Senior Staff Engineer, Renewable Engineering



Invenergy

**165**  
Projects  
Developed

**25GW**  
Capacity  
Developed

**\$37Bil+**  
Completed  
Transactions

**7.8Mil**  
Homes  
Powered

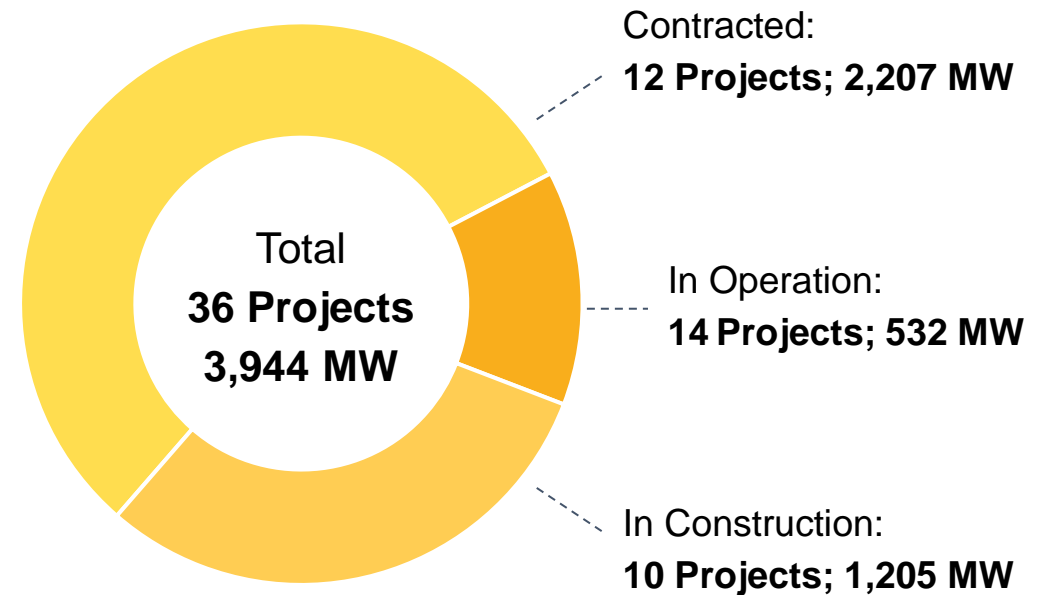
**8.2Mil**  
Cars off the  
Road Equivalent

# Invenergy Solar Experience



- **Harnessing the sun since 2012 to deliver low-cost renewable energy**
- **Experience including**
  - Serving utility, public power, and corporate customers
  - Structures including PPAs and build/development-transfer
- **Meeting growing demand for solar with:**
  - Technology innovation
  - Relationships with Tier 1 suppliers
  - Unparallel project execution
  - Safe & reliable operations

## Invenergy Solar Portfolio



# Invenergy's Experience In Ohio

## 11+ Years of Experience Developing Renewable Energy Projects in the Buckeye State

- **Hardin Solar I**
  - 150 MW Project located in Hardin County, OH
  - [Approved OPSB Certificate](#) - February 15, 2018
  - Nearing completion of construction
    - Logged 3,000,000+ Construction Manhours from Ohio residents
  - Commercial Operations no later than 12/31/2020
- **Hardin Solar II**
  - Proposed 170 MW Project located in Hardin County, OH
  - [Approved OPSB Certificate](#) - May 16, 2019
- **Vinton Solar**
  - Proposed 125 MW Project located in Vinton County, OH
  - [Approved OPSB Certificate](#) - September 20, 2018

Invenergy



"State approves projects that will create Ohio's two largest solar farms" - Columbus Business First, February 15, 2018



"Vinton County optimistic about proposed solar-energy project" - Columbus Dispatch, September 11, 2017



Sponsorship at the Vinton County Fair, July 2017

# Hardin Solar Energy III LLC

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- **Hardin Solar Energy III LLC (Hardin Solar III) is a wholly-owned subsidiary of Invenergy Solar Development North America LLC (Invenergy).**
- **Preliminary diligence of the site began in early 2020.**
  - Discussions with area landowners.
  - Environmental and cultural investigations.
- **Utilization of PJM queue positions AD1-130, AD2-086, and AD2-091.**





# Description of Project

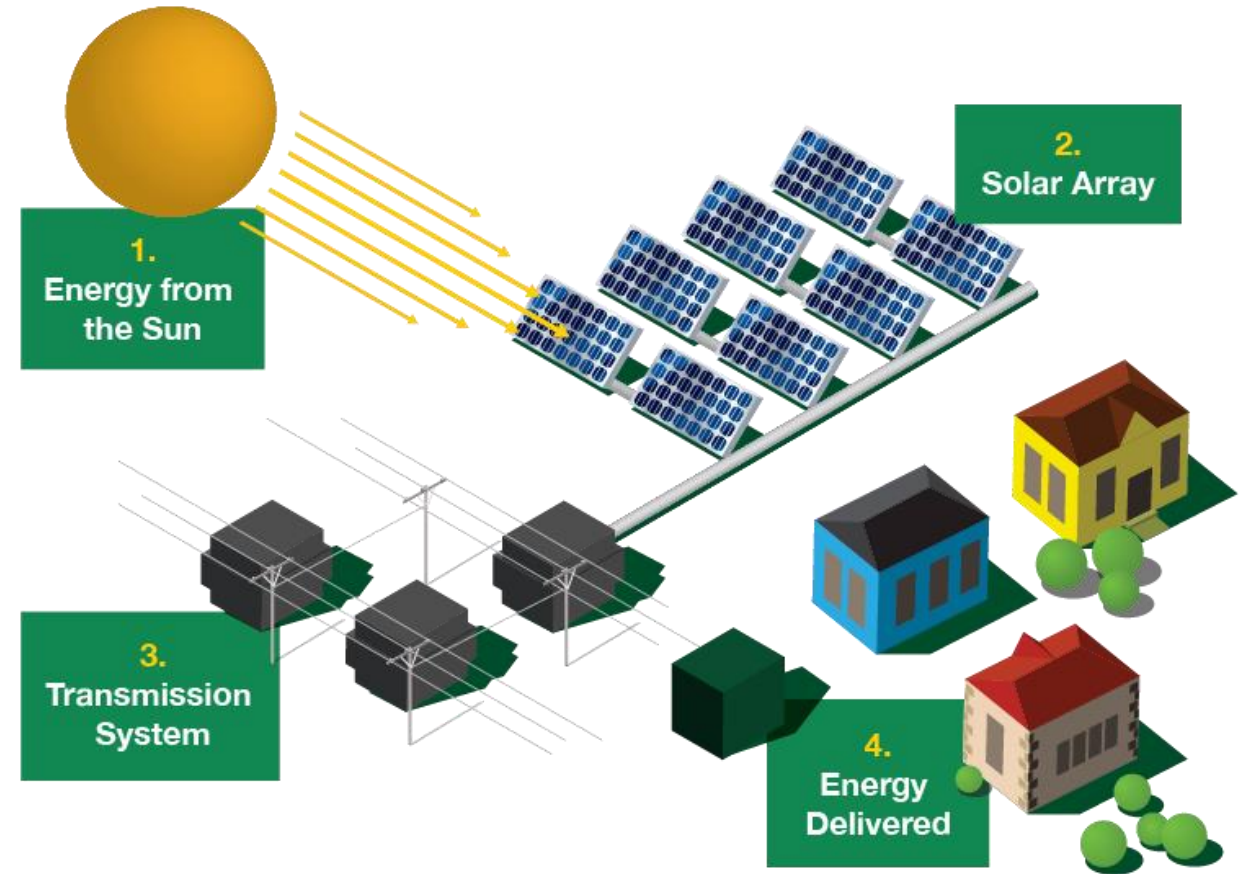
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# How Solar Facilities Function

Proven  
Technology

Innovative  
Design

Sufficient Year-  
Round  
Sunlight



Invenergy uses **state-of-the-art photovoltaic (PV) panels** to harness the sun's energy. Nearby transmission infrastructure will deliver energy to the grid.

# Hardin Solar III Energy Center

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- **The Hardin Solar III Energy Center (Project) is a 300 MW solar-powered electric generation facility located in Marion, Roundhead, and McDonald Townships, Hardin County, Ohio.**
  - The Project is sited approximately 15 miles southeast of Lima, adjacent to the Hardin Solar I and II facilities.
- **The Project's point of interconnection is the existing Hardin Switch 345 kV substation, which already serves the Hardin Solar I facility.**
- **The Project represents Invenergy's commitment to continued investment in Ohio utility scale solar generation projects.**



## Smart Columbus Introduces Renewable Energy Procurement for Large Columbus Region Energy Buyers

Cardinal Health, Huntington and AEP sign on as first customers to buy Ohio-based clean energy from Smart Columbus Energy, powered by AEP Energy

# Why Ohio?

## Cost Competitive Technology

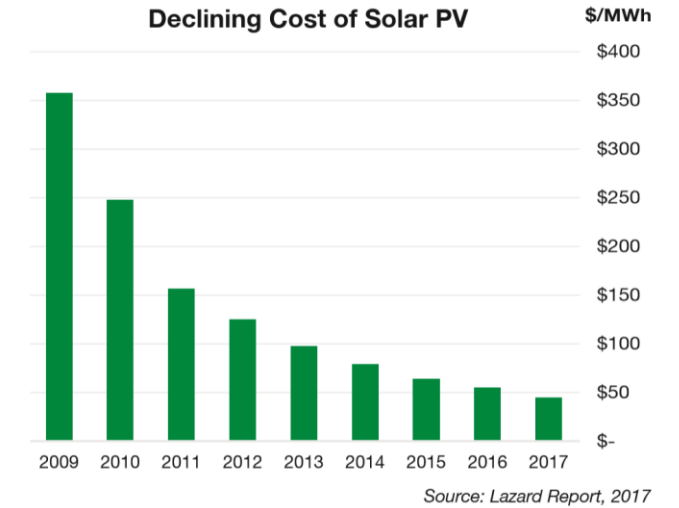
- Solar technology is simple and scalable; its flexible and reliable. With costs that have decreased by nearly 90% in less than a decade, solar is now one of the least expensive and fastest growing sources of new energy generation in the world.

## Commercial and Municipal Demand

- City of Columbus – Proposed Electric Service Aggregation Program (Ballot Issue 1)
- Smart Columbus Energy- Aggregation for local large corporate and industrial organizations that consume approximately 5,000MWh or more per year.
- Nationwide Commercial & Industrial Users

## Decarbonization goals from utilities like American Electric Power (AEP)

- Renewable projects and relationship to carbon emission free energy generation.
- Cleaner air/water.



### GOVERNMENT

## Columbus voters approve green-energy aggregation plan

Bill Bush

Published 10:48 p.m. ET Nov. 3, 2020 | Updated 11:28 a.m. ET Nov. 4, 2020

### The Columbus Dispatch

#### AEP's Carbon Emission Reduction Goals

**70%** by 2030

**80%** by 2050

(both from a 2000 baseline)

# Project Schedule

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# Schedule



## Development Timeline

2020 - 2022

### Development

Activities include permitting, environmental and interconnection studies, and public feedback

2022 - 2023

### Construction

Groundbreaking, construction, inspections and QAQC, Final commissioning and certification

Q4 2023

### Operations

Operations and continuous Maintenance of equipment and the land.

# Operations / Decommissioning

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- **The operational life of the facility is expected to be at least 35 years.**
  - Activities during operations include landscape and vegetative management, equipment monitoring and inspections, and project area security.
- **The owner of the facility will be responsible for decommissioning the facility at the end of its operational life, as required by the conditions put forth by the Ohio Power Siting Board.**
  - A bond or other financial security will be put into place prior to the commencement of construction to ensure that sufficient funds are available for decommissioning.
  - Decommissioning involves the removal of equipment and the reclamation of the land.



# Project Components and Facilities

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# Bi-facial Solar Modules

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- **Proven technology with an innovative design.**
- **Solar panels are made of glass, aluminum, copper and other common and recyclable materials.**
- **Solar panels are safe to touch, attach to your home or install in your neighborhood. Solar panels have been attached to houses, hospitals and airports for decades.**
- **While there are different kinds of solar panels, the most common are made of silica – the second most abundant element on earth after oxygen. The faces of silica panels are similar in substance to standard household glass.**
- **Hardin Solar III will utilize panels that will pass the EPA's Toxicity Characteristic Leaching Procedure (TCLP) test.**



# Single-Axis Tracking System

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- **Adjusts orientation towards the sun throughout the day to harness energy at the optimal angle.**
- **Accommodates variation in ground cover plant species.**
- **Approximate 15' total height profile at most extreme tracking position.**



# Other Components & Design

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- The Project will also include associated support facilities such as access roads, meteorological stations, buried electrical collection lines, inverters, and a collection substation.
- Conceptual engineering designs are underway and more detailed designs will be developed by professional engineers prior to construction.



# Project Components and Facilities

- **The project is undergoing the design and review of a vegetative management and landscaping plan.**
  - The vegetative management plan will dictate how/where/what plantings will be placed under the solar panels, as well as how those plantings are to be monitored and maintained to ensure there are no project issues with drainage, invasive species, and mowings or clearings.
  - The landscape plan dictates how/where/what aesthetic plantings will be placed near and around the project area. There are typically multiple configurations of planting 'treatments' that can be utilized to achieve appropriate viewsheds of the project and project area.



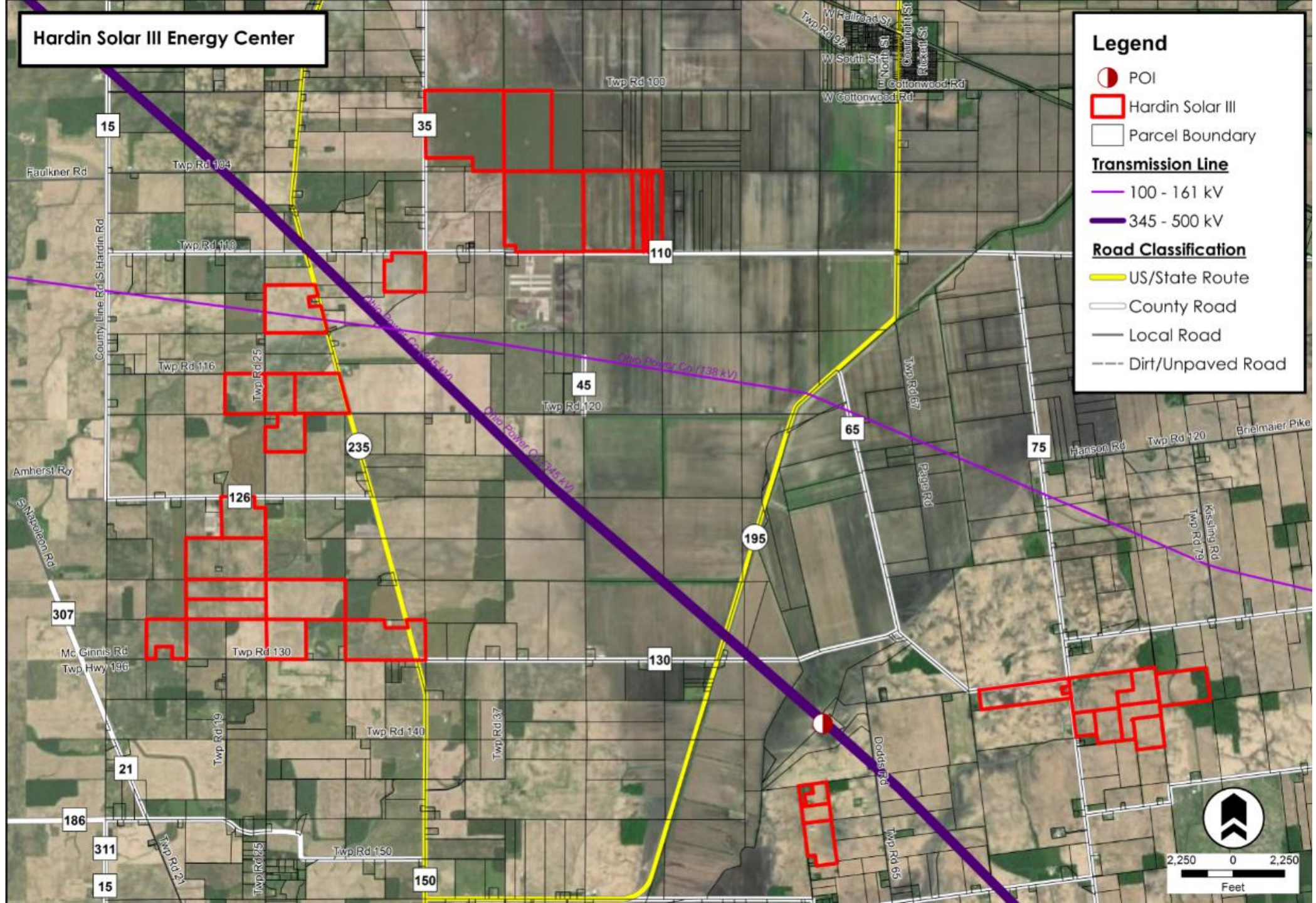
# Project Map

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# Hardin Solar III Energy Center

### Legend

- POI
- Hardin Solar III
- Parcel Boundary
- Transmission Line**
  - 100 - 161 kV
  - 345 - 500 kV
- Road Classification**
  - US/State Route
  - County Road
  - Local Road
  - Dirt/Unpaved Road



# Project Studies

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# Project Studies

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The following (non-exhaustive list of) studies help inform and advance Project design, incorporate avoidance of sensitive environmental resources, and ensure a high degree of environmental stewardship for the Project area.

- Ecological Site Characterization Study
- Wetlands and Waterbodies Delineation
- Vegetative Management and Landscaping Plan
- Applicable wildlife surveys based on consultations from state and/or federal agencies.
- Phase I Environmental Site Assessment



# Project Studies- Continued

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The following (non-exhaustive list of) studies inform the design of the Project from a land use and socioeconomic perspective. These studies can help create value for the local community.

- Phase I Cultural Resources Investigation
- Viewshed Analysis and Aesthetic Resources Inventory
- Road Survey and Conceptual Traffic Plan
- Decommissioning Plan
- Economic Impact Analysis
- Drain Tile Mapping
- Noise Impact Study
- Property Value Study

# Project Studies – Continued

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The following (non-exhaustive list of) studies inform and advance Project design from an engineering perspective.

- Full Geotechnical Testing (pile load tests and cone penetration tests)
- Hydrology Study
- Topography and aerial imaging

# Community Engagement and Impacts

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# Our Invenergy Impact



**\$216 million**

Total 2018 local economic investment in wages & benefits, lease payments, and state & local taxes



**\$1.2 million**

Given to different cause-based organizations in 2019, focusing on veterans, education, emergency services & environmental stewardship



**10% veterans**

Percent of Invenergy's U.S.-based workforce who are military veterans or reservists

**ORACLE®**

**Sustainability Innovation Award**

*Awarded by Oracle to Invenergy in 2017 for sustainability leadership*



Proud to Support

**Four Star Sponsor**

*First sustainable power developer & operator to sponsor National FFA (Future Farmers of America formerly)*



**TAMARINDO**  
strategic communications advisory

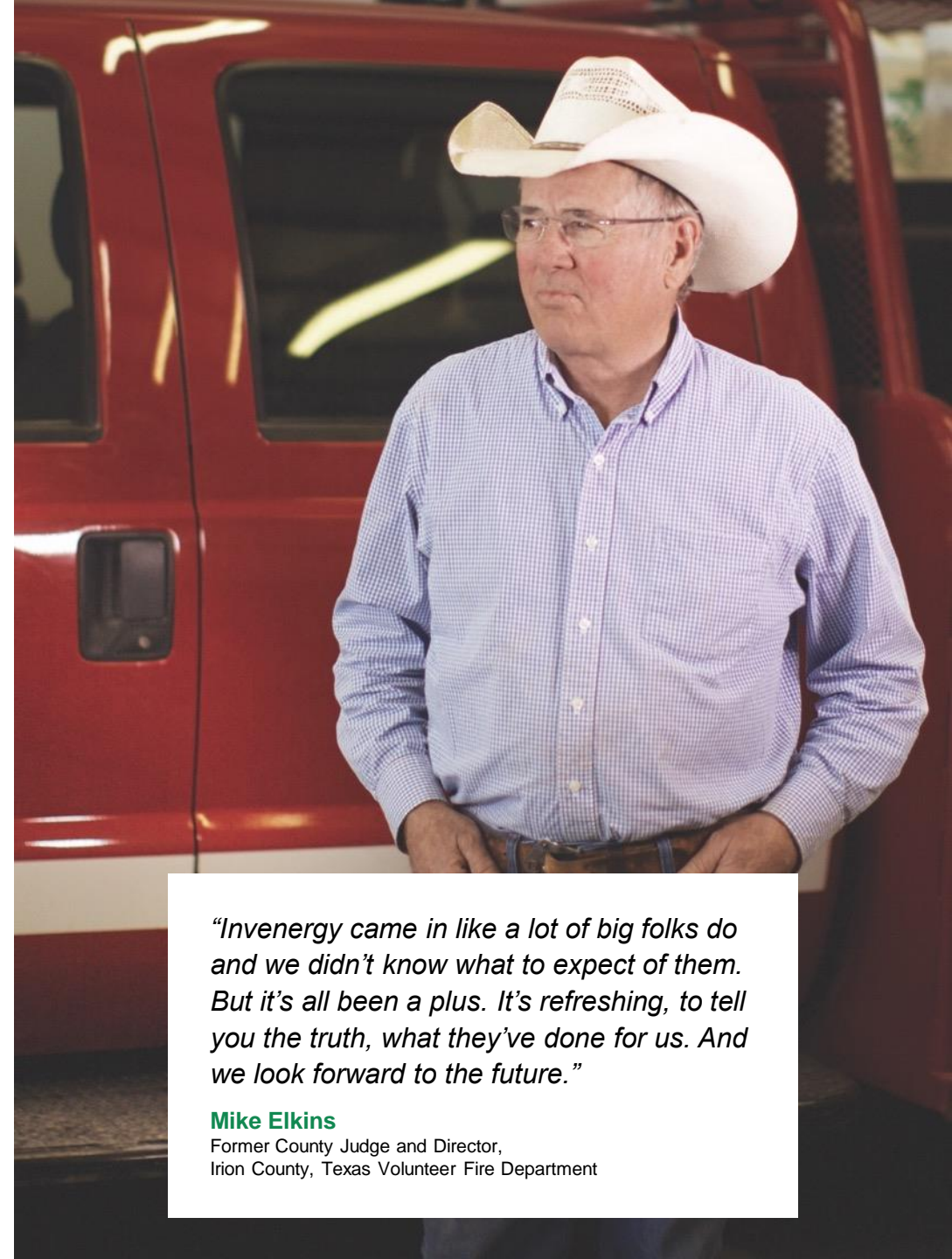
**#1 Renewables Reputation**

*Top brand reputation among 1,500 companies active in the North American renewables market*



**HIRE Vets Gold Medallion**

*Recognized in 2019 by the US Department of Labor for commitment to hiring veterans*



*"Invenergy came in like a lot of big folks do and we didn't know what to expect of them. But it's all been a plus. It's refreshing, to tell you the truth, what they've done for us. And we look forward to the future."*

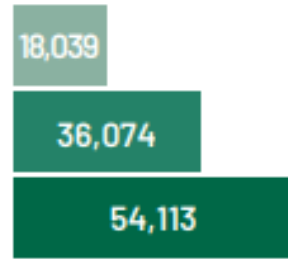
**Mike Elkins**

Former County Judge and Director,  
Irion County, Texas Volunteer Fire Department

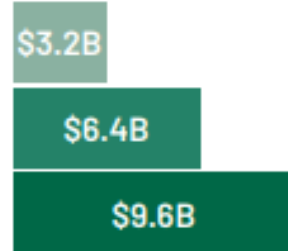
# Measuring the Economic Impacts of Utility Scale Solar in Ohio

## One-Time Construction Phase Impacts

### Total Jobs



### Total Economic Impacts



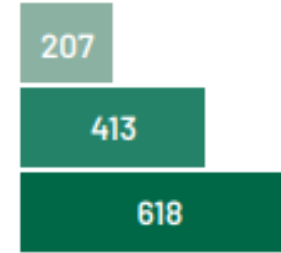
### Deployment Scenarios

- Low (2.5 GW)
- Moderate (5 GW)
- Aggressive (7.5 GW)

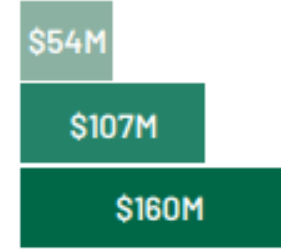
\* All calculations assume 80% of labor and 30% of materials originate in Ohio.

## Annual Operations Phase Impacts

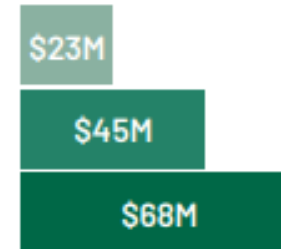
### Total Jobs



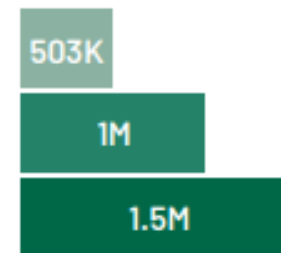
### Total Economic Impacts



### Tax Revenues (PILOT)



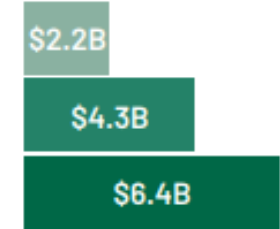
### Total Homes Powered



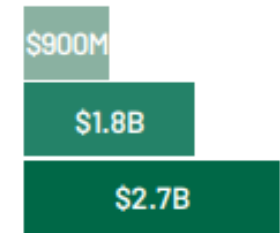
## Aggregate Lifespan Operations Phase Impacts



### Total Economic Impacts



### Tax Revenues (PILOT)



In the aggressive (7.5 GW) deployment scenario, the energy produced could power all of the households in Columbus, Ohio roughly **four** times over.

Conducted by the George V. Voinovich School of Leadership and Public Affairs at Ohio University

Invenergy

## Hardin Solar III Energy Center

The Hardin Solar III Energy Center is a proposed solar power generation facility of up to 300 megawatt (MW) in Hardin County, Ohio, targeted to begin operating in 2023. Solar technology uses the power of the sun to deliver clean, renewable energy and is now one of the lowest-cost energy sources available.



Enough sustainable energy to power **58,561 American homes**



An estimated **\$166 million** invested in Hardin County through new taxes and landowners' payments over the life of the project



An estimated **800 construction jobs** supported during peak construction



Up to **4 full-time operations and maintenance jobs** created once operational



Emissions reductions equivalent to taking **64,188 cars off the road**



Supports local education, emergency & veteran services and environmental stewardship



Uses the most up-to-date, innovative technology



Up to **300 megawatts** of sustainable energy

### Development Timeline

2020–2022

**Development**

Activities include engineering, environmental studies, permitting, interconnection studies, etc.

2022 - 2023

**Construction**

Q4 2023

**Operation**

# Municipal / County Expected Annual Payment Distributions

- Based on preliminary design and county tax levy rates, this table shows a baseline approximation/minimum of the annual municipal and county payments that could be made by the Project.
- The breakdown by township is roughly 60% - 20% - 20%, respectively.
- Other and/or additional payments are possible.

	Marion Township	McDonald Township	Roundhead Township
County	\$373,128.60	\$122,033.90	\$116,337.52
Township	\$93,282.15	\$40,677.97	\$63,985.64
School	\$970,134.36	\$317,288.14	\$302,477.56
Vocational Schools	\$80,844.53	\$26,440.68	\$25,206.46
Other Levies	\$102,610.36	\$33,559.32	\$31,992.82
<b>Total</b>	<b><u>\$1,620,000.00</u></b>	<b><u>\$540,000.00</u></b>	<b><u>\$540,000.00</u></b>

# Benefits of Vegetation Management Approach

- Soil/planting diversity and health
- Improvement in stormwater drainage through diversified plantings and long rooted systems that can reduce soil erosion
- Reduction or elimination of annual soil tilling
- Improvement in downstream water quality through the reduction or elimination of fertilizer use
- Can help increase pollinator habitats

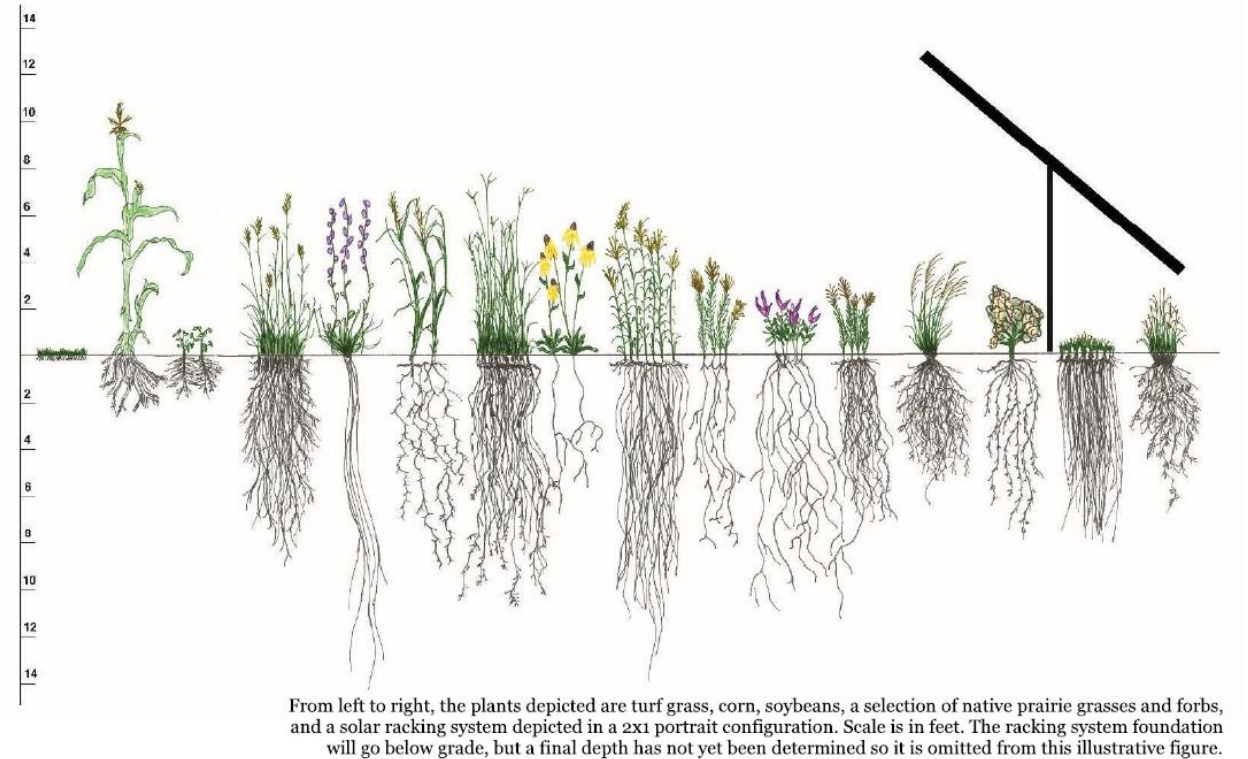


Figure 2: Selected Native Plant Rooting Depths and Growth Heights



# Involvement in Hardin County

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## Local Outreach

- Mailings
- Door-to-Door Efforts (w/ social distancing protocol)
- Online Engagement (via Project website)
- Phone Call Efforts

## Community Engagement

- Hardin County Commissioners
- Hardin County Engineer
- Hardin County Chamber and Business Alliance

This engagement is ongoing, and we look forward to strengthening our relationships in Hardin County.

# OPSB Review and Certification Process

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Power Siting Board



Power Siting Board



- Before any company can build a “major utility facility,” the OPSB assures that it benefits Ohio’s citizens, promotes the state’s economic interests, and protects the environment and land use.
- Public and local government participation are strongly encouraged, but decision-making authority rests with the OPSB.
- If approved, the OPSB issues a certificate for the construction, operation, and maintenance of the facility.



## Electric Generation

Solar farms  
50 MW and greater

Wind farms  
5 MW and greater

Fossil fuel plants  
50 MW and greater

## Electric Transmission

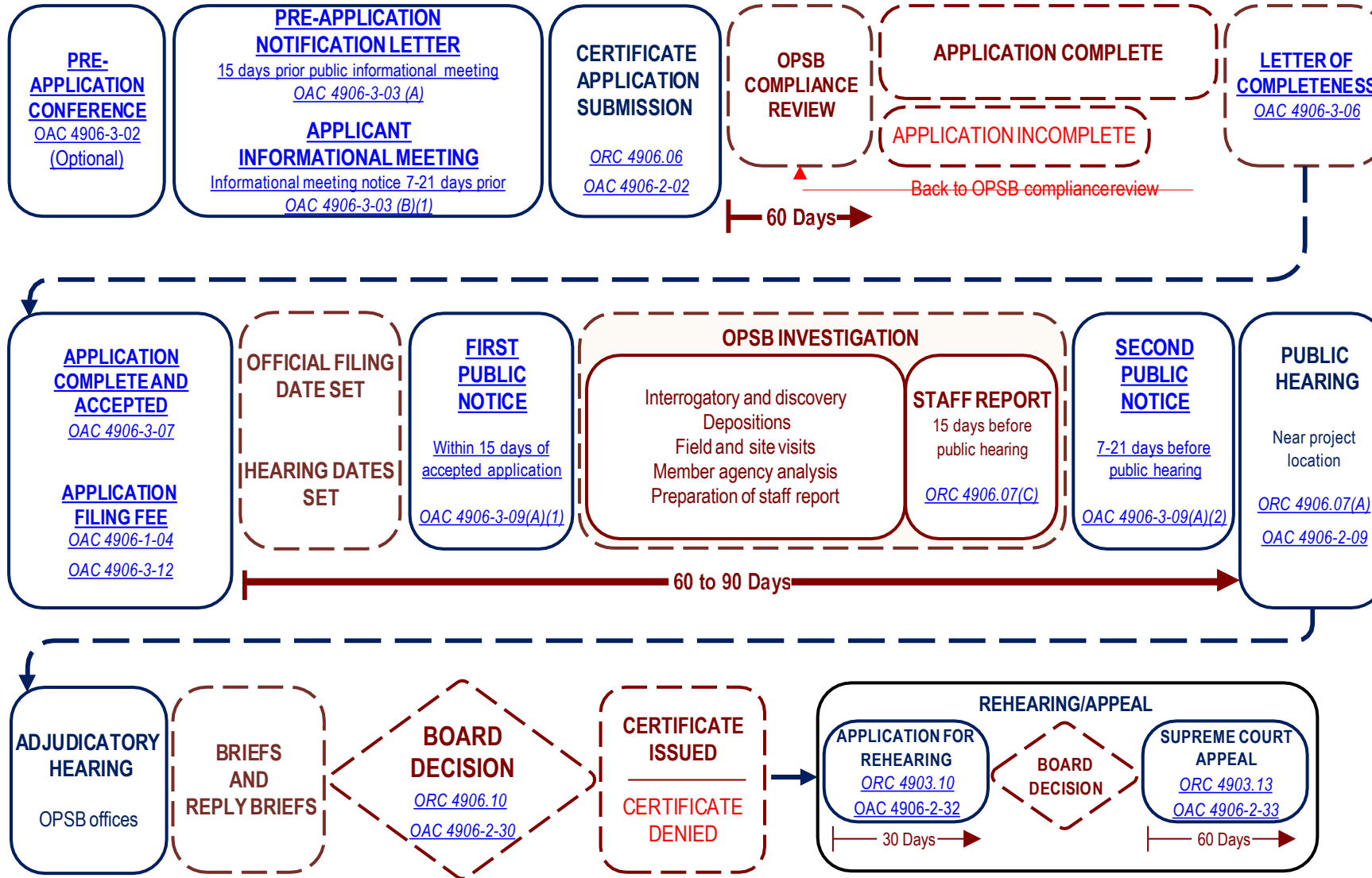
Lines and associated  
facilities 100 kV and  
greater

## Natural Gas Transmission

Pipelines greater  
than 500 feet in  
length and 9 inches  
in diameter

Maximum operating  
pressure greater  
than 125 psi





### LEGEND



Construction and operation are monitored by the OPSB



## Public informational meeting

Developer educates community about project and gathers input to consider in developing its application. OPSB representatives provide info about siting process and public participation.

## Public comments

Written comments are filed in the case where they inform the Board members and staff. Comments are accepted at any time after a case number is established.

**Online:** [OPSB.ohio.gov](https://opsb.ohio.gov)

**Email:** [contactopsb@puco.ohio.gov](mailto:contactopsb@puco.ohio.gov)

**Mail:**

Ohio Power Siting Board

180 E. Broad Street

Columbus, Ohio 43215

## Local public hearing

Board obtains sworn statements from the public which are transcribed and become part of the official record that the Board considers before making its decision.

Held at least 15 days after staff publishes its report of investigation. Notification letters sent to property owners and local officials. Newspaper notice 7-21 before the hearing.

## Adjudicatory hearing

The developer, OPSB staff, and parties to the case present testimony and evidence regarding the facility and cross examine each other. Intervention grants individuals and local governments the right to participate as a party in the adjudicatory hearing, file for rehearing, or appeal to the Supreme Court of Ohio.

Held approximately 2 weeks after the local public hearing. Property owners and local officials receive letters advising them of right to intervene.



- If a project is approved, the OPSB monitors construction and operation to ensure compliance with the certificate and any conditions.
- The developer must notify landowners prior to start of construction.
- The developer must establish a complaint resolution process to address concerns resulting from project construction and operation.
- OPSB can assist individuals who feel they are not obtaining a resolution from the developer.





## OPSB Website

[OPSB.ohio.gov](http://OPSB.ohio.gov)

- Case summary page
- Process information
- Calendar of events

## Docketing information system

[dis.puc.state.oh.us](http://dis.puc.state.oh.us)

- View case documents and public comments
- Subscribe for case notifications

[contactOPSB@puco.ohio.gov](mailto:contactOPSB@puco.ohio.gov)

866-270-6772

The Ohio Power Siting Board

180 East Broad Street

Columbus, Ohio 43215



# Applicant Contact Information

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# Applicant Contact Information

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For further information about the Hardin Solar III Energy Center, please contact us at:

**Web:**

<https://hardinsolariii.com>

**Phone:**

**(312) 429-2589**

**Email:**

[info@hardinsolariii.com](mailto:info@hardinsolariii.com)

**Mailing Address:**

**Hardin Solar Energy III LLC**

**c/o Invenergy LLC**

**One South Wacker Drive, Suite 1800**

**Chicago, IL 60606**

Invenergy

**We're building a  
sustainable world.**

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**Join us.** [in](#) [f](#) [twitter](#) [instagram](#)

