



THANK YOU

for attending the

Tracy Solar Open House

We enjoyed meeting you!



The Principles That Guide Us

MISSION STATEMENT

Delivering renewable **solutions**
to lead the transition to a
sustainable energy future.

our core VALUES

Safety

Good Sense

Accountability

Transparency

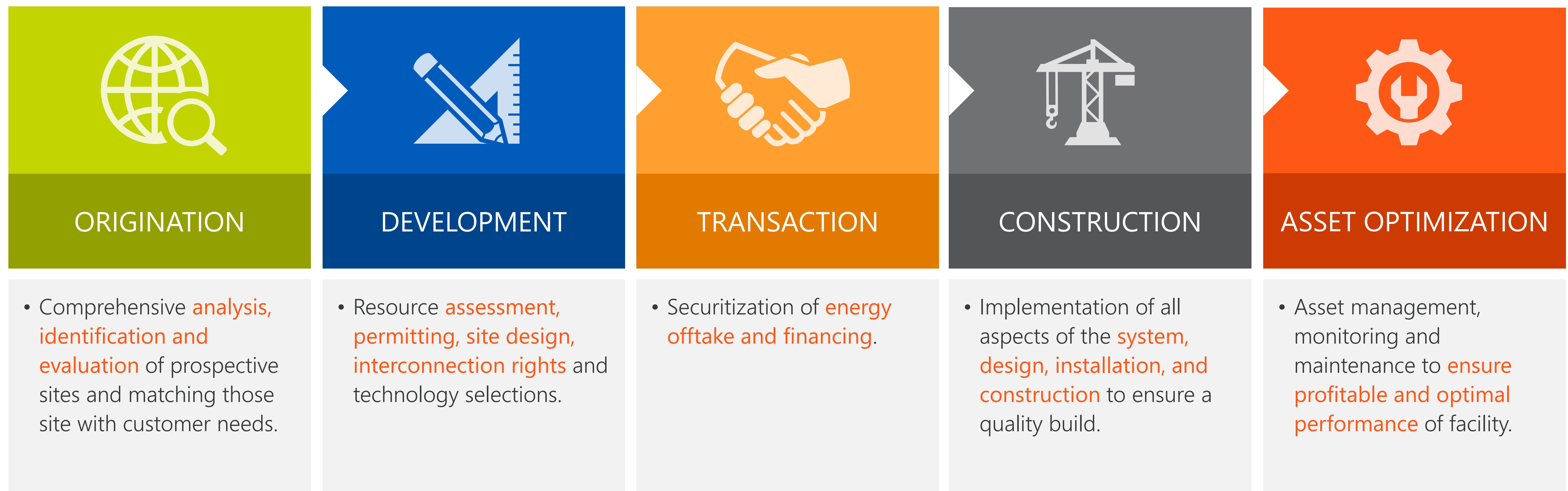
Teamwork

Respect

Passion

Creating **Value** from Origination to Commercial Operation

EDFR is a **technology agnostic provider** of renewable generation, storage, and management solutions.



Leading The Way in Renewable Energy

EDF RENEWABLES NORTH AMERICA

16 GW
developed

10 GW
O&M contract

24 GW
pipeline

30+
years experience

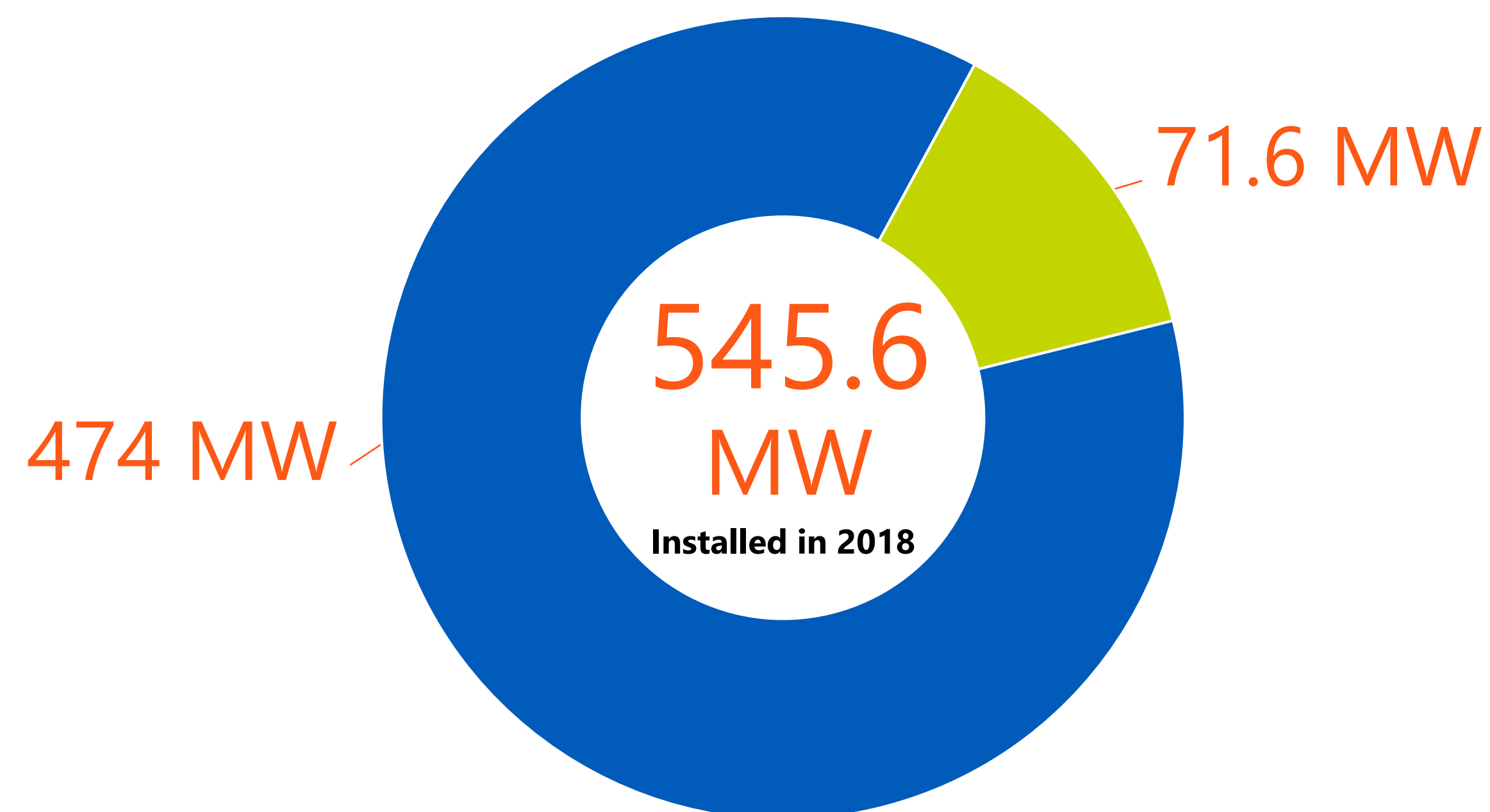
1,112
employees

as of 12/31/18

2018 Placed in Service

DISTRIBUTED			
PROJECT	STATE	MWp	OFFTAKER (OWNER)
Delta 1 & 2	MI	29.3	Lansing BWL (CMS)
Annapolis Landfill	MD	18.1	City Annapolis (Building Energy)
Southwick	MA	6.6	Eversource
MN Community Solar 1	MN	16.4	Community (US Solar)
Ogdensburg	NY	1.2	OBPA (AEP)

GRID-SCALE			
PROJECT	STATE	MWp	OFFTAKER
Ivester*	IA	91	MidAmerican
Copenhagen	NY	80	National Grid
Pecan	NC	111	Dominion (DBS)
Pendleton	ON	20	IESO
Barlow	ON	18	IESO
Bluemex	SON	119	CFE
Stoneray	MN	35	SMMPA



*sold to MidAmerican prior to construction/commissioning
as of /12/31/2018

Environmental and Economic Impact



272

Approximate number of permanent jobs created in North America



\$1,636,800

Potential annual revenue for farmers / landowners due to land lease payments



6,421,502,329

Equivalent number of bottles of water conserved



220,785.3

Equivalent homes powered
(MWh/10.4 MW per home, per year, per EIA household data 2017)



2018 economic IMPACT

We are committed to our environment and the communities we work in and we are proud of the impact our projects create.

1,826,632

Avoided metric tons of Carbon dioxide annually

CO2 reduction equivalent to taking

388,645

cars off the road

36,532,632

Avoided metric tons of Carbon Dioxide over lifetime, CO2



Safety Counts



2018 Statistics

0.96 TRIR

Total Recordable Incident Rate

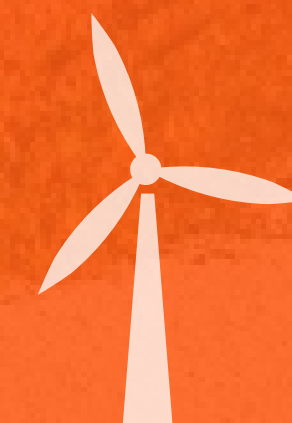
0.84 DART

Days Away, Restricted, or Transferred



10 GW

Under Contract in
North America



5,230

Wind Turbines



19

Turbine
Manufacturers



1,970

Solar Inverters



405+

Employees



TRACY

solar project

OVERVIEW

Project Name: Tracy Solar

Project Owner: EDF Renewables

Host Municipality: Orleans & Clayton

Renewable Source: Solar

Proposed Capacity: 119 MWac

Proposed Land Use: ~ 1,000 acres

PROPOSED CONNECTION POINT

115 kV transmission line
bisecting the project

CONNECTION LINE

A short (<0.1 mile) 115 kV
line proposed from the
project substation to the
proposed connection
point located on private
property



TRACY

solar project

WHY DID WE CHOOSE THIS LOCATION?

SUPPORTIVE COMMUNITIES:

- Both towns support the development of solar projects

AVAILABLE LANDS:

- Project sited on non-prime farmland, mostly cleared, facilitating project permitting

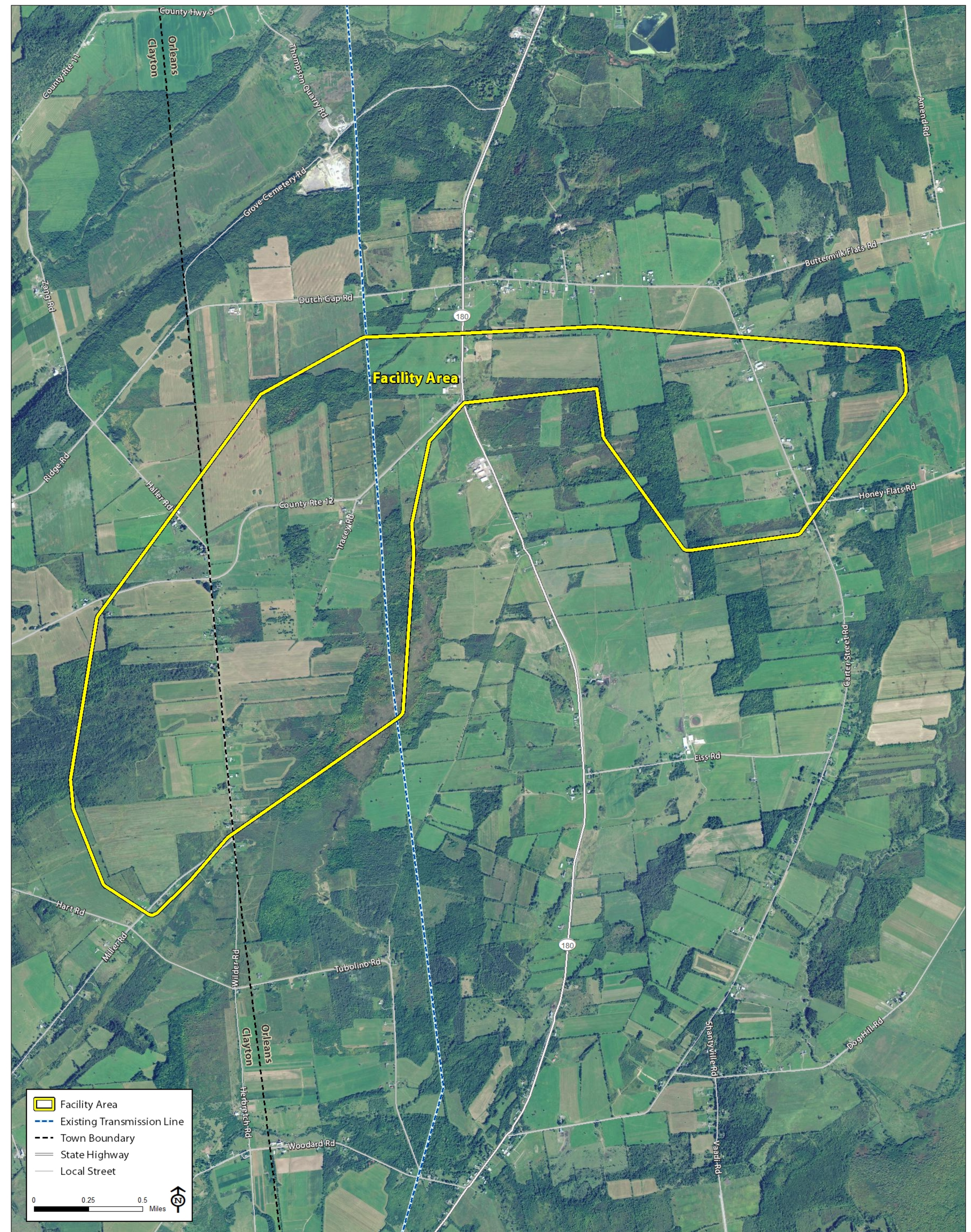
PROXIMITY TO TRANSMISSION LINE:

- Located adjacent to National Grid 'Thousand Island to Lyme' 115kV transmission line



FACILITY AREA

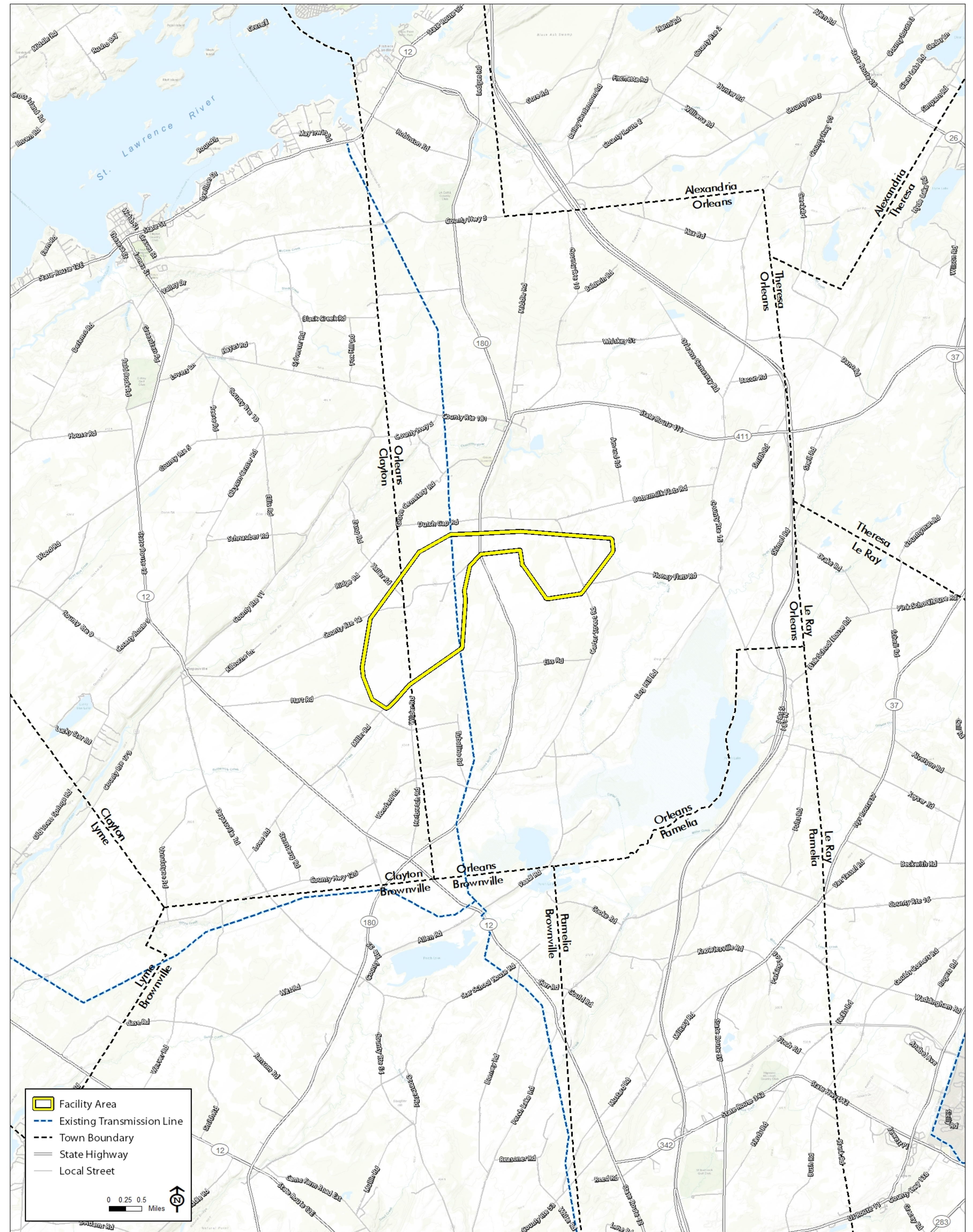
- Targeting ~1,000 acres of privately owned land within the Facility Area in the Towns of Orleans and Clayton
- Will produce enough electricity to power more than 27,200 New York households
- Leased parcels (not shown) are within the Facility Area





FACILITY AREA

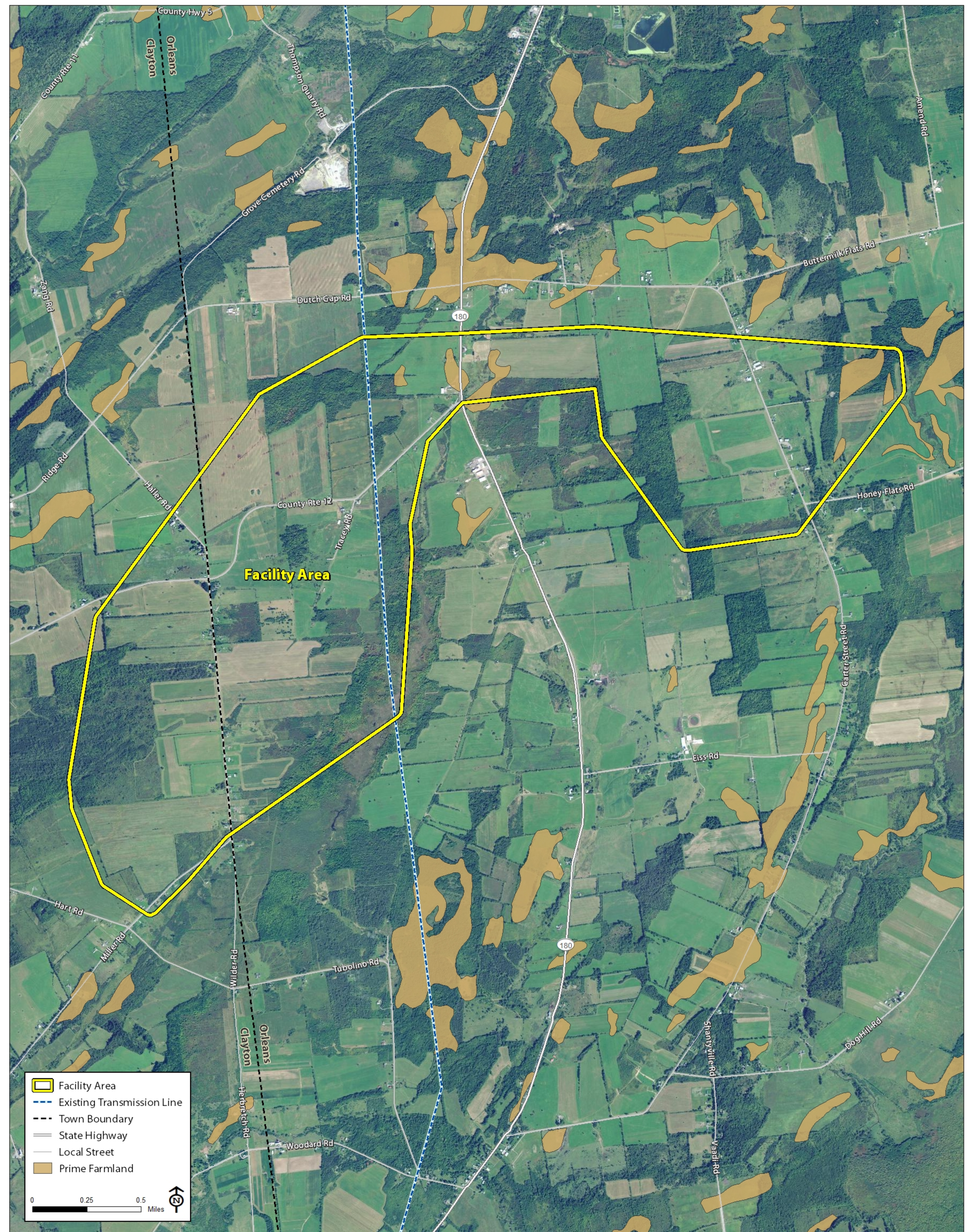
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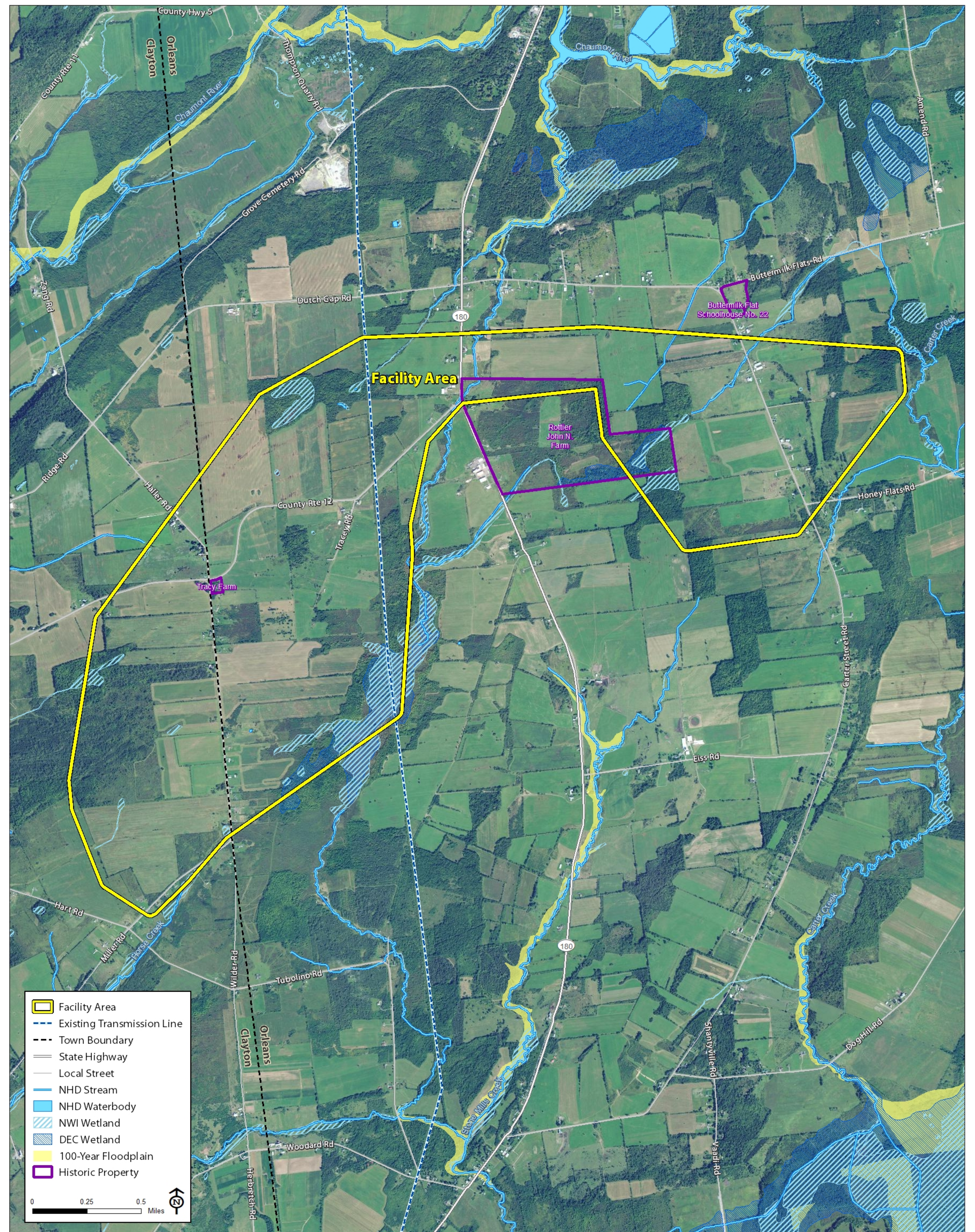
PRIME FARMLAND MAP

- Soil designations as characterized by U.S. Department of Agriculture
- Prime farmland shown in brown



CONSTRAINTS MAP

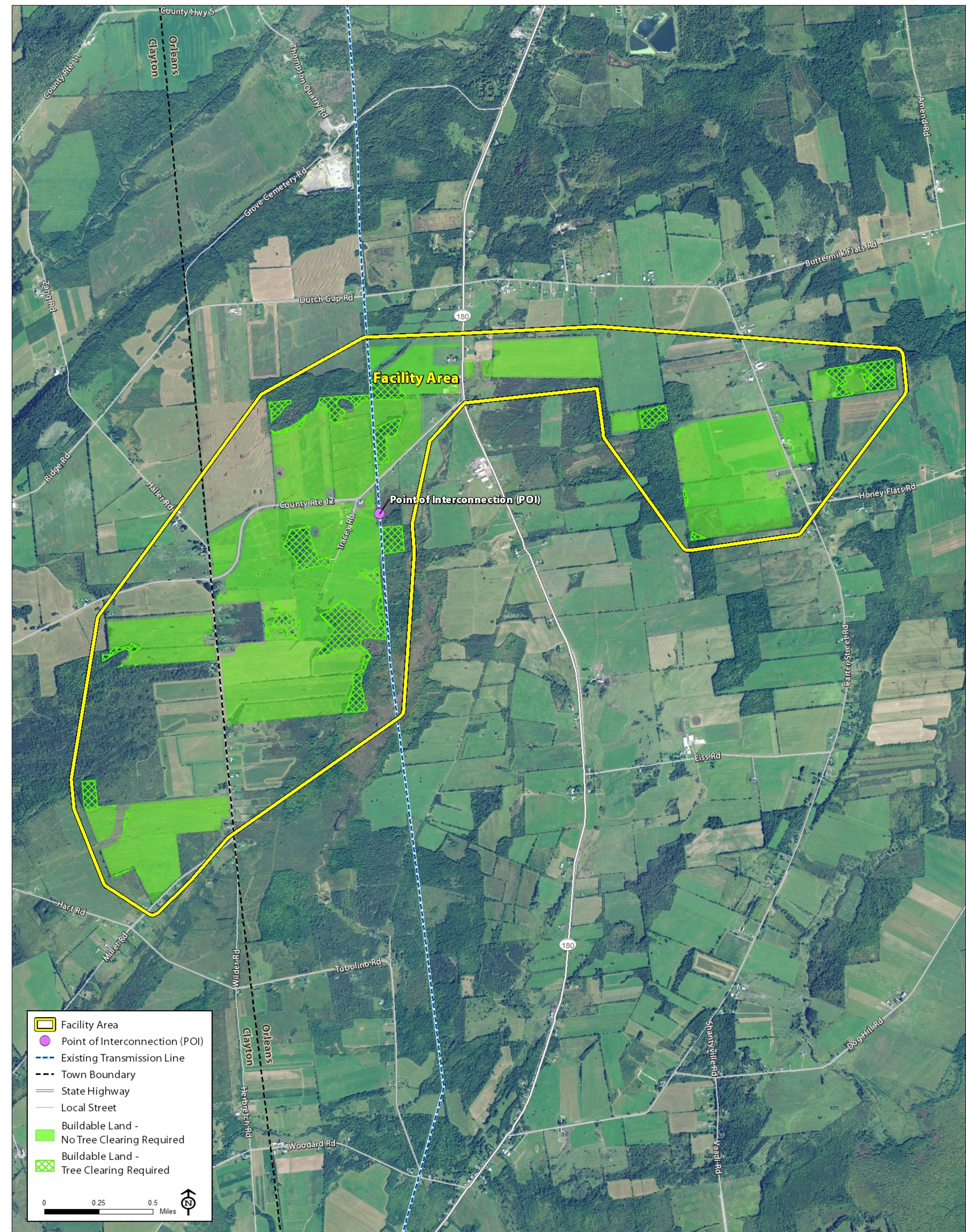
- Constraints shown are according to publicly available data
- Additional studies to be undertaken throughout 2019 and 2020 to confirm presence of features
- Maps will be updated and shared publicly once studies are completed





BUILDABLE AREA MAP

- Indicates areas where solar panels, inverters and transformers can be installed within project land parcels
- Prefer to build within areas with no tree clearing required
- Constraints identified on previous map and setbacks excluded from buildable area (i.e. 50 ft from external parcel boundaries and roads, 100 ft from wetlands)





ENVIRONMENTAL STUDIES

- EDF Renewables will be initiating environmental studies of the proposed Facility Area.
- Coordinating with:
 - NYS Department of Public Service (NYSDPS)
 - NYS Department of Environmental Conservation (NYSDEC)
 - NYS Department of Agriculture and Markets (NYSDAM)
 - State Historic Preservation Office (NYSHPO), and regional stakeholders to ensure that potential environmental impacts are fully considered
 - Federal Aviation Administration (FAA)

Studies to help avoid and minimize potential environmental impacts are anticipated to include the following:

WETLANDS

- Review of U.S. Army Corps of Engineers (USACE) and NYSDEC Wetland Mapping
- Field investigations to identify and delineate wetlands and streams

RARE/THREATENED/ENDANGERED SPECIES

- Coordination with NYSDEC and USFWS
- Coordination with regional wildlife advocacy groups
- Field investigations to identify potential habitat

ACOUSTIC STUDIES

- Noise impact assessment, including background sound monitoring and sound propagation modeling



ENVIRONMENTAL STUDIES



ARCHEOLOGY

- Coordination with the New York State Historic Preservation Office (NYSHPO) and regional advocacy groups
- Research and archaeological field investigations, as needed, to ensure that facilities avoid archaeologically sensitive areas

HISTORIC RESOURCES

- Coordination with NYSHPO and regional historical groups
- Historic properties are evaluated in terms of their eligibility for listing on the State and National Registers of Historic Places
- Evaluate potential visual effect on historic properties

VISUAL IMPACTS

- Identification of visually sensitive sites
- Viewshed mapping of areas of potential visibility
- Coordination with stakeholders and preparation of visual simulations to illustrate what the facility will look like when completed
- Landscaping to screen views of the facility from roads and neighbors



ADDITIONAL STUDIES and CONSIDERATIONS

PUBLIC HEALTH AND SAFETY

- Air Emissions
- Noise and Vibration
- Site Security

SOCIOECONOMIC EFFECTS

- Jobs
- Intervenor Funding
- Environmental Justice

EFFECT ON TRANSPORTATION AND COMMUNICATIONS

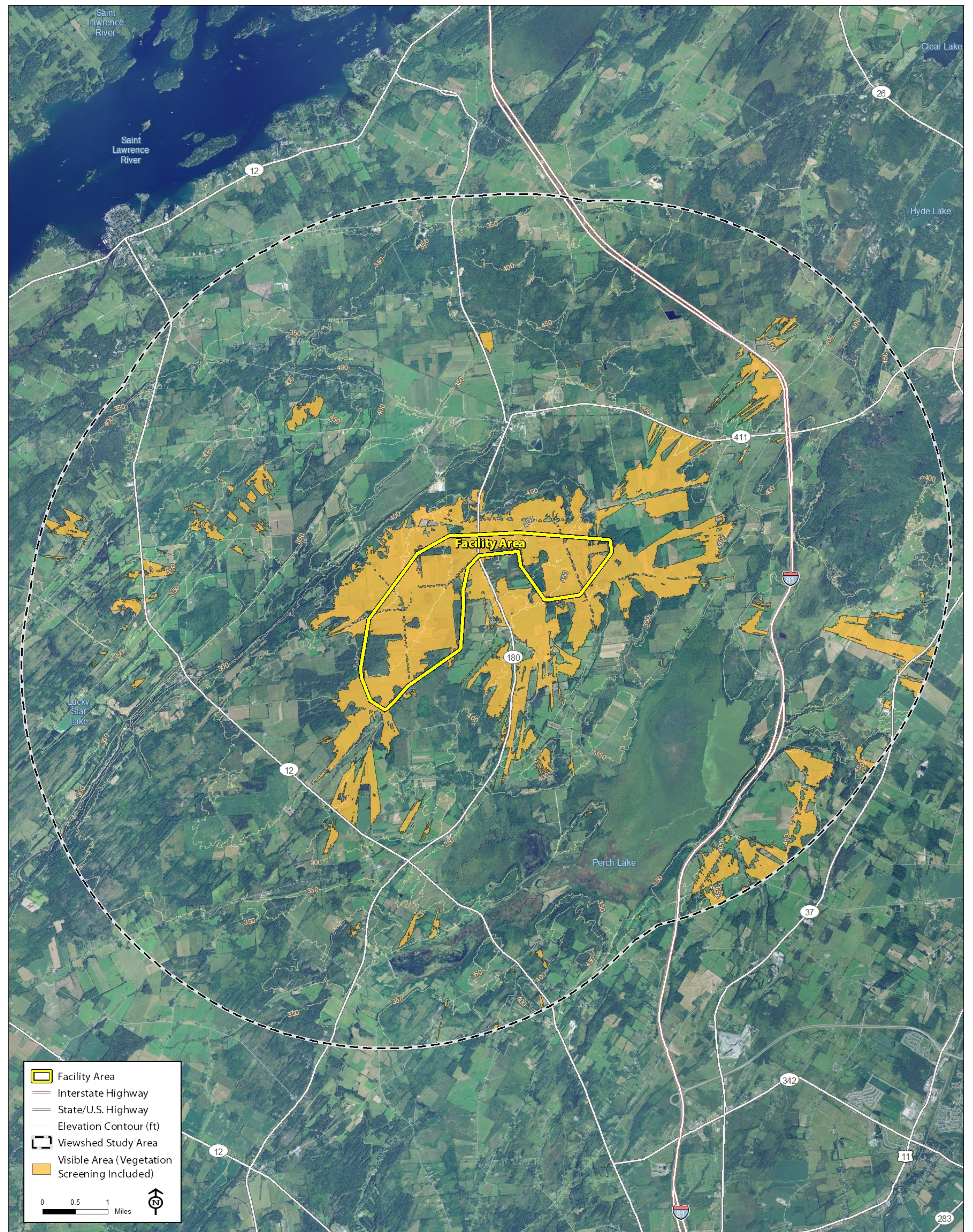
- Road Use Agreement
- Effect on Communications and Telecommunications
- Coordination with Local, State, and Federal Transportation and Communication Authorities

SITE RESTORATION AND DECOMMISSIONING

- Decommissioning Plan
- Financial Security Mechanism

VIEWSHED ANALYSIS MAP

- Indicates areas from which solar panels may be visible following project construction and vegetation screening
- Visibility was calculated using ground elevation, vegetation heights, proposed solar panel locations, and proposed vegetation screening





SITE DESIGN

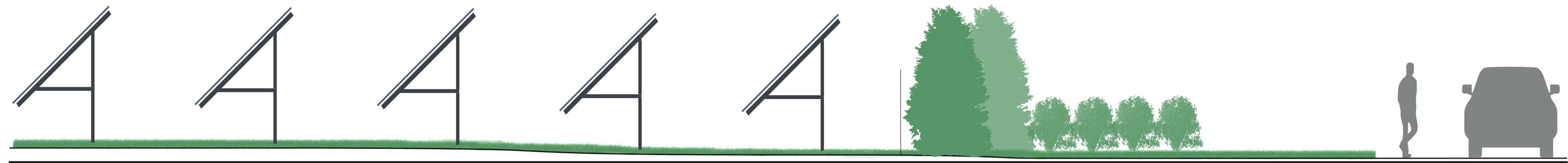
Approaches to site design for solar projects include selection of fencing and planting materials intended to screen or soften views of the project from adjacent roadways and properties.



SITE DESIGN

Fencing

- Fencing is required for solar facilities for safety and security purposes
- Selection of decorative or vernacular fence styles may be considered if permitted by the facility's finance and insurance entities
- Fence styles are typically based on examples within the local community so installed fencing will blend into the existing visual setting



Proposed Solar Array



Fencing & Plantings



SITE DESIGN

Evergreen Hedges

- Plantings along fencelines can help integrate a solar facility with the surrounding landscape
- Vegetation may include a screening hedge made up of evergreen trees and shrubs

Native Plantings

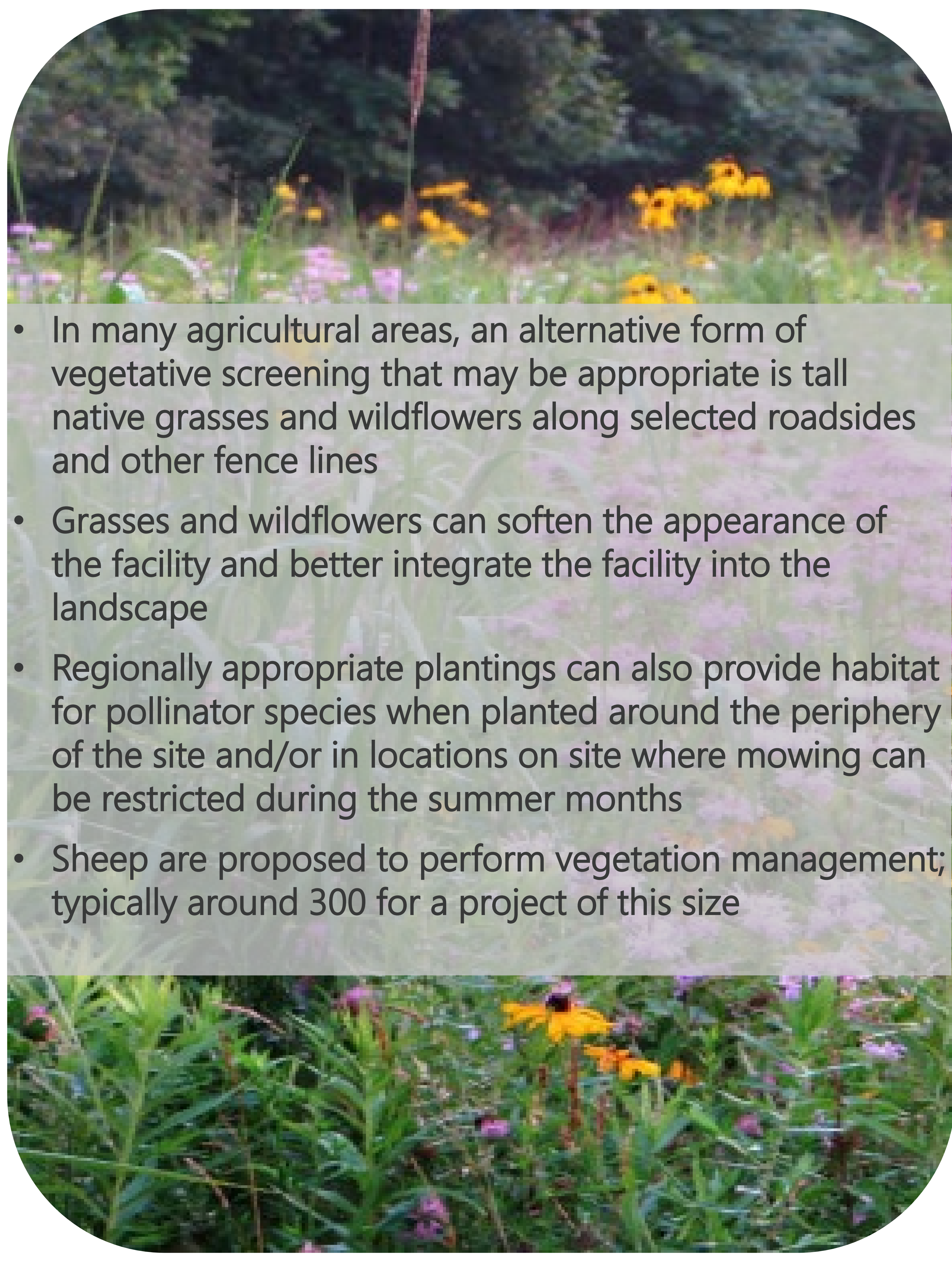
- Use of native shrubs and plantings softens the overall visual effect of the facility and provide wildlife benefits
- Plantings can help to better integrate the facility into the surrounding landscape



SITE DESIGN

Pollinator-Friendly Grasses and Wildflowers



- 
- In many agricultural areas, an alternative form of vegetative screening that may be appropriate is tall native grasses and wildflowers along selected roadsides and other fence lines
 - Grasses and wildflowers can soften the appearance of the facility and better integrate the facility into the landscape
 - Regionally appropriate plantings can also provide habitat for pollinator species when planted around the periphery of the site and/or in locations on site where mowing can be restricted during the summer months
 - Sheep are proposed to perform vegetation management; typically around 300 for a project of this size

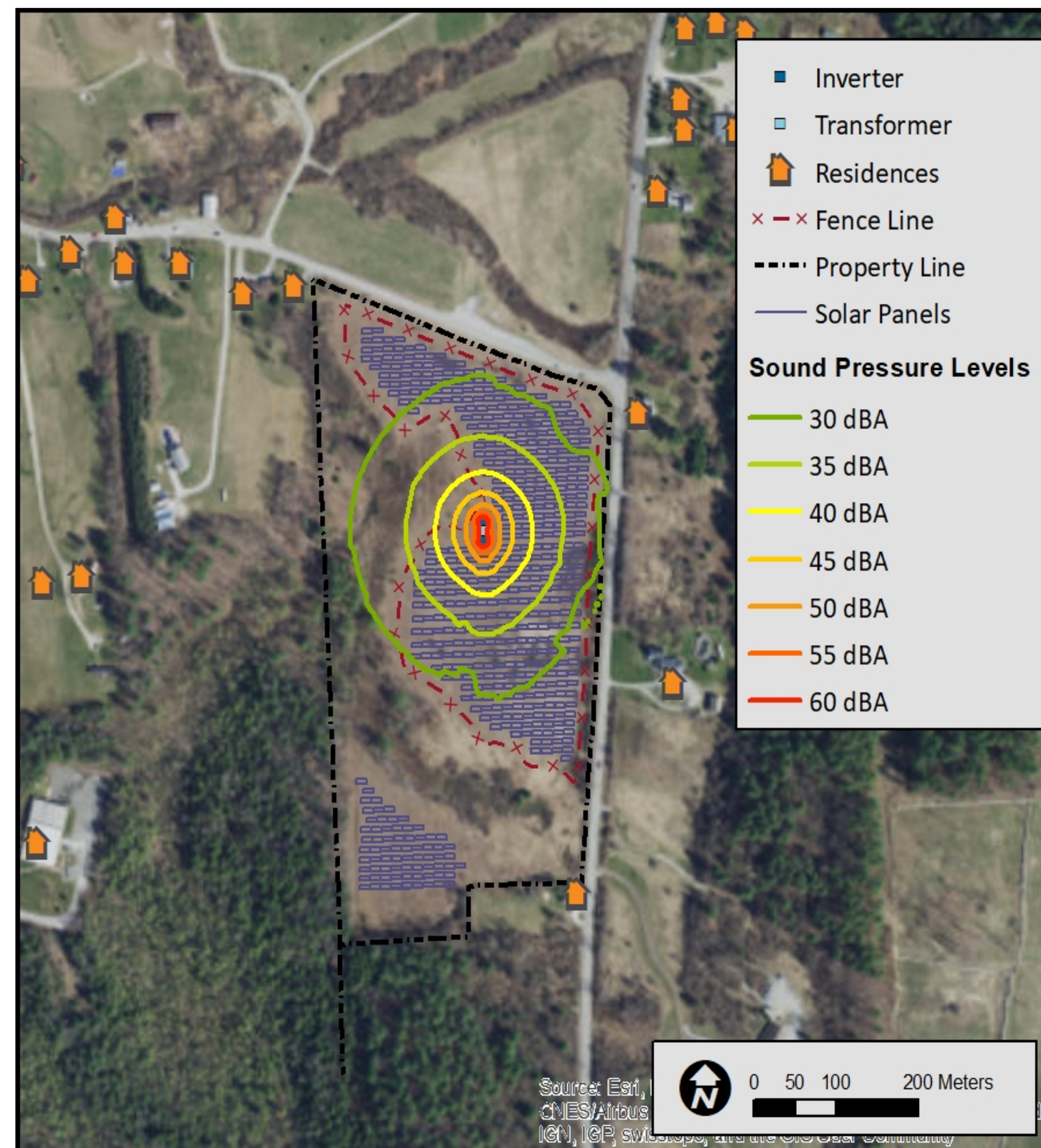
Noise Impact Assessments

EDF Renewables will conduct a noise assessment to assure that the project is compatible with the surrounding area. The assessment includes:

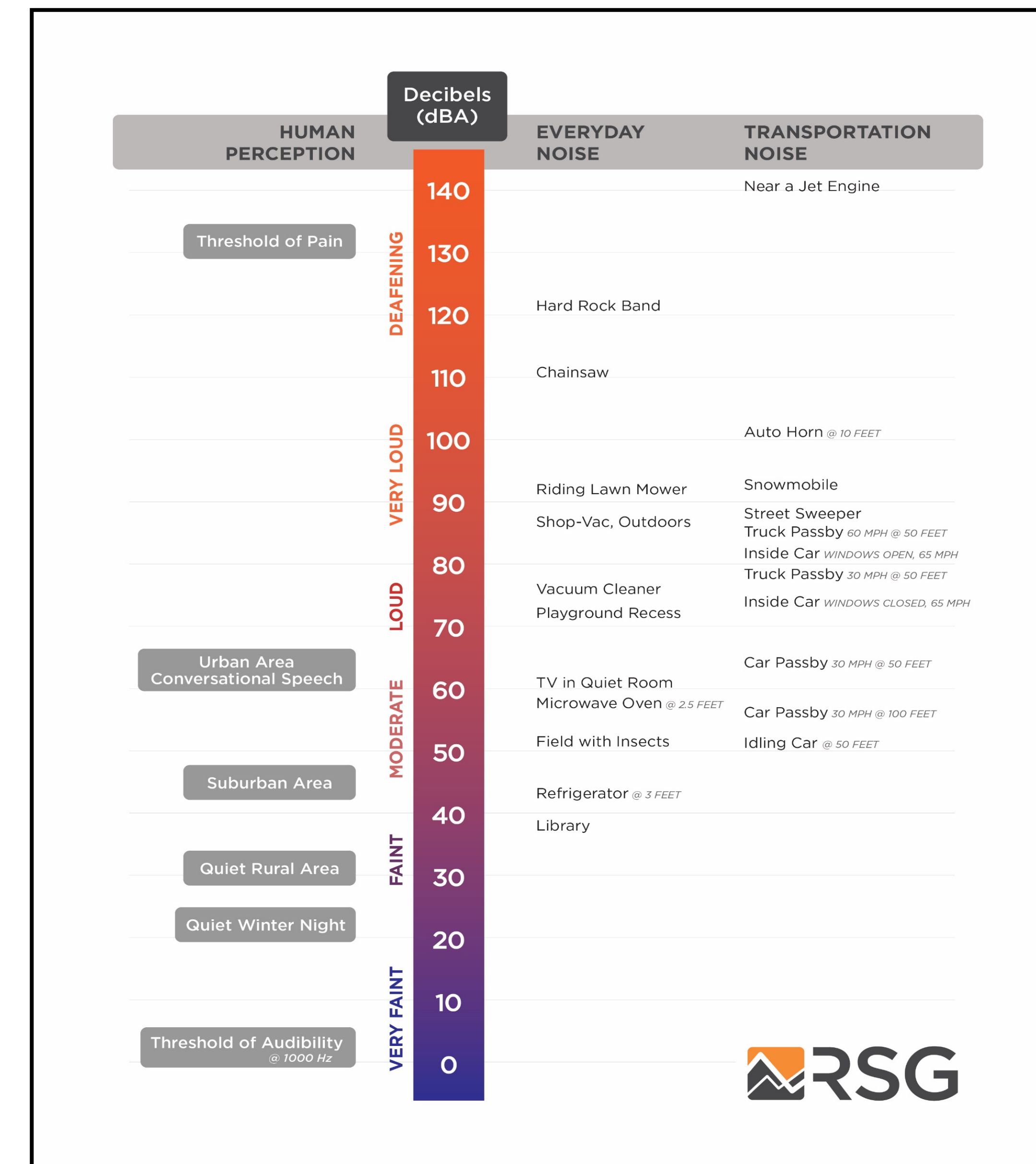
- Background sound level monitoring to assess existing sound levels
- Sound propagation modeling to project future sound levels
- Development of mitigation recommendations to ensure that the project is in compliance with meetings applicable noise limits.
- Compliance with NYS Article 10 noise requirements

EQUIPMENT	SOUND GENERATION
Solar Panels	The panels do not generate any sound
Inverters	These convert DC to AC current and generate some sound during the day
Transformers	These increase the voltage for collection and distribution and generate some sound day and night

Sample Sound Map



Common Sound Sources & Levels



PROJECT TIMELINE



March 2019

File Draft Public Involvement Plan

June 13 2019

Host First Public Meeting

Summer 2019

Begin Environmental Studies & Engineering

Winter 2019/2020

Host Third and Fourth Public Meetings

Fall 2021

Article 10 Approval

Spring 2022

Start of Construction

2019

2020

2021

2022

2023

May 2019

File Final Public Involvement Plan

Summer 2019 –

Host Second Public Meeting

Fall 2019

File Draft Public Scoping Statement

Spring 2020

Submission of Article 10 Application

Winter 2021/2022

Compliance Filings for Article 10

Fall 2023
Commercial Operation

*****PUBLIC ENGAGEMENT CONTINUES THROUGHOUT THE PROJECT LIFECYCLE*****

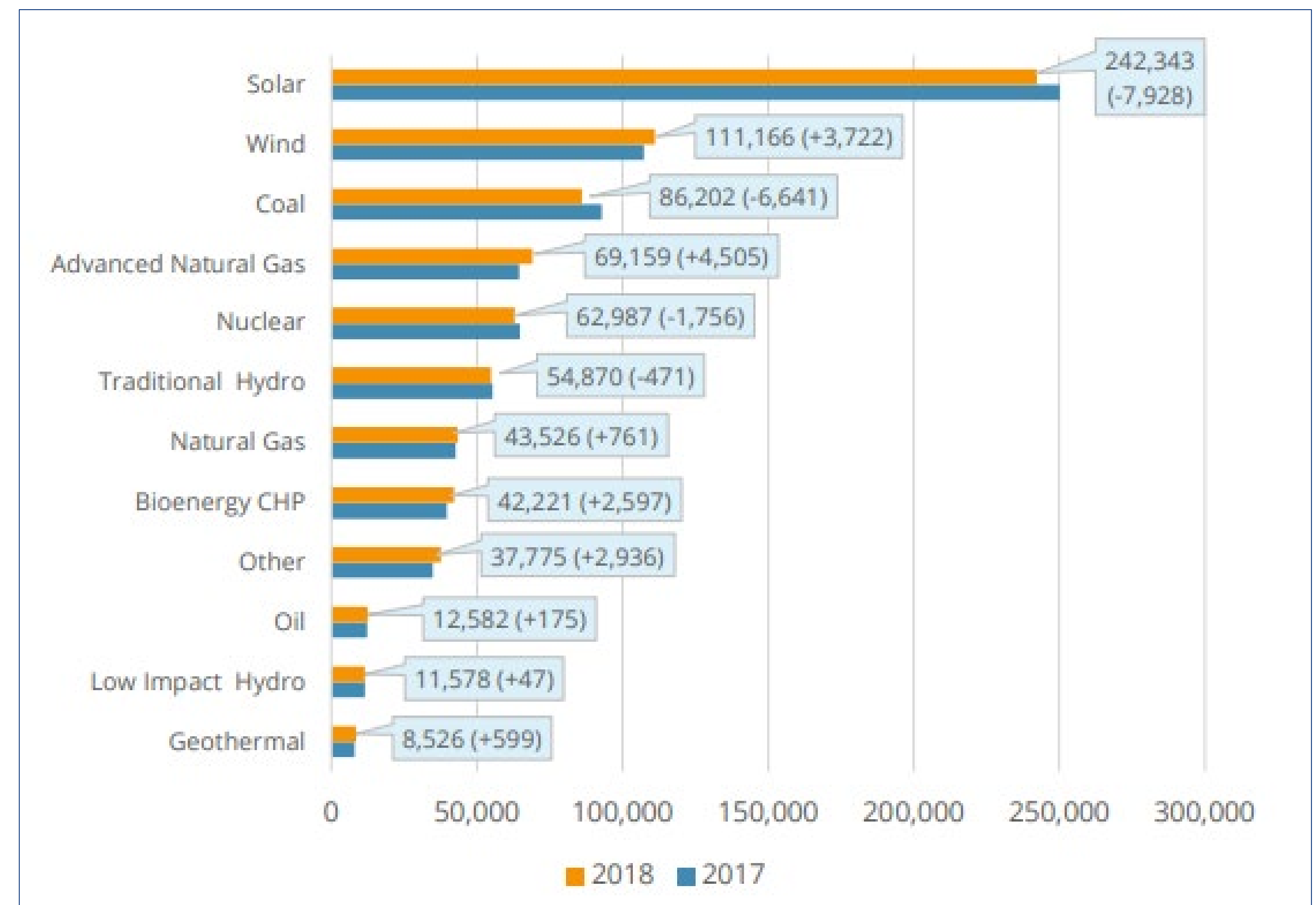


THE OPPORTUNITY OF RENEWABLE ENERGY

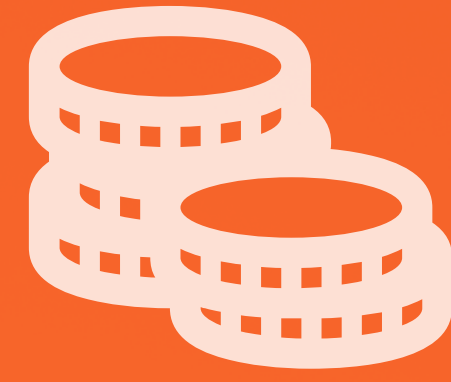
- In 2018, the solar industry generated a **\$17 billion investment** in the American economy.
- Average **annual growth rate of 50%** over the last 10 years
- Generates enough electricity to power more than **12.3 million homes**
- Solar generation offsets more than 73 million metric tons of CO2 emissions each year, equivalent to taking 15.6 million vehicles off the road

*Solar employment grew about **six times faster** than the **overall U.S. economy** from 2013-2018*

Solar – The #1 Employer in Energy



Source: U.S. Energy and Employment Report (USEER) published by the U.S. Department of Energy (DOE)



Total project cost anticipated
~ **\$100 million**
A portion is sourced locally
(i.e. labor, material supply)



More than
200 jobs
anticipated during the peak
of construction



Estimated
**3 full time
permanent**
highly skilled jobs during
operation



Propose to contribute
**\$6 million in direct
revenues** for the Town of
Orleans, the Town of Clayton,
Jefferson County, and the
LaFargeville School District in
the first 20 years of operation



TRACY
solar project

LOCAL BENEFITS

DIRECT BENEFITS:

- Surveying, civil engineering, mechanical work, electrical work, road construction, transportation equipment, earthwork activities, maintenance of vehicle fleet, maintenance paths, snow removal and other related services.

INDIRECT BENEFITS:

- Meals and accommodation for construction personnel; products, services and supplies.



MAXIMIZING LAND USE

SOLAR ENERGY PROVIDES STABLE REVENUES FOR 30+ YEARS

EDF Renewables enters into lease agreements with host-landowners and offers annual payments for use of the lands at competitive lease rates.



SHEEP GRAZING
AT ARNPRIOR SOLAR (EDF
RENEWABLES PROJECT) IN
ONTARIO, CANADA

LAND WILL BE RETURNED TO PRE-EXISTING STATE

At the end of the useful life of the solar facility or the expiration of the lease (whichever comes first), the infrastructure is decommissioned and the land is returned to its pre-existing condition.

SOLAR FACILITATES COMPLEMENTARY USES

- Planting clover or other ground cover can stimulate foraging of bees and butterflies.
- Some sites in Europe, the United States and Canada have successfully integrated sheep grazing amongst the solar panels.



BEES AT ARNPRIOR SOLAR
IN ONTARIO PRODUCED
385 JARS OF HONEY IN 2017

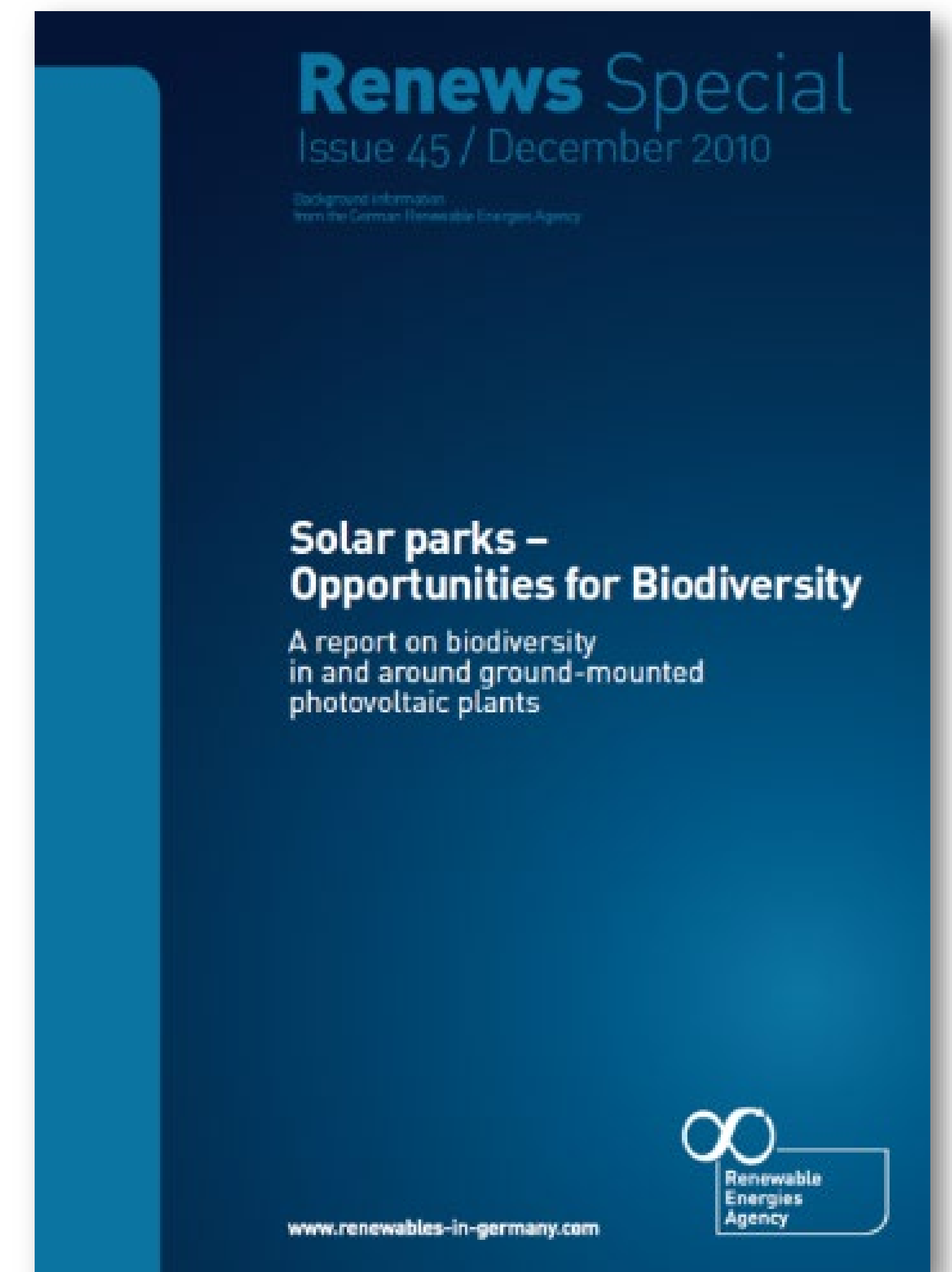


SOLAR PARKS CAN ENHANCE BIODIVERSITY

“

...as well as making an important contribution to future energy supplies, solar parks can also provide a refuge for plants and animals.”

”



Source: Renewes (2010)

“

With appropriate land management, solar farms have the potential to support wildlife and contribute to national biodiversity targets.”

”

Source: BRE (2014)





TRACY

solar project

BEING A GOOD NEIGHBOR

- EDF Renewables integrates projects into the local community through thorough community engagement.
- Stakeholders have the opportunity to communicate their interests for integration into the project design.
- Much of the land beneath and around solar panels remains unused and can accommodate vegetation in the form of grasses, clover or cultural meadows.

Visual Buffer Example



Initial View



Initial Planting

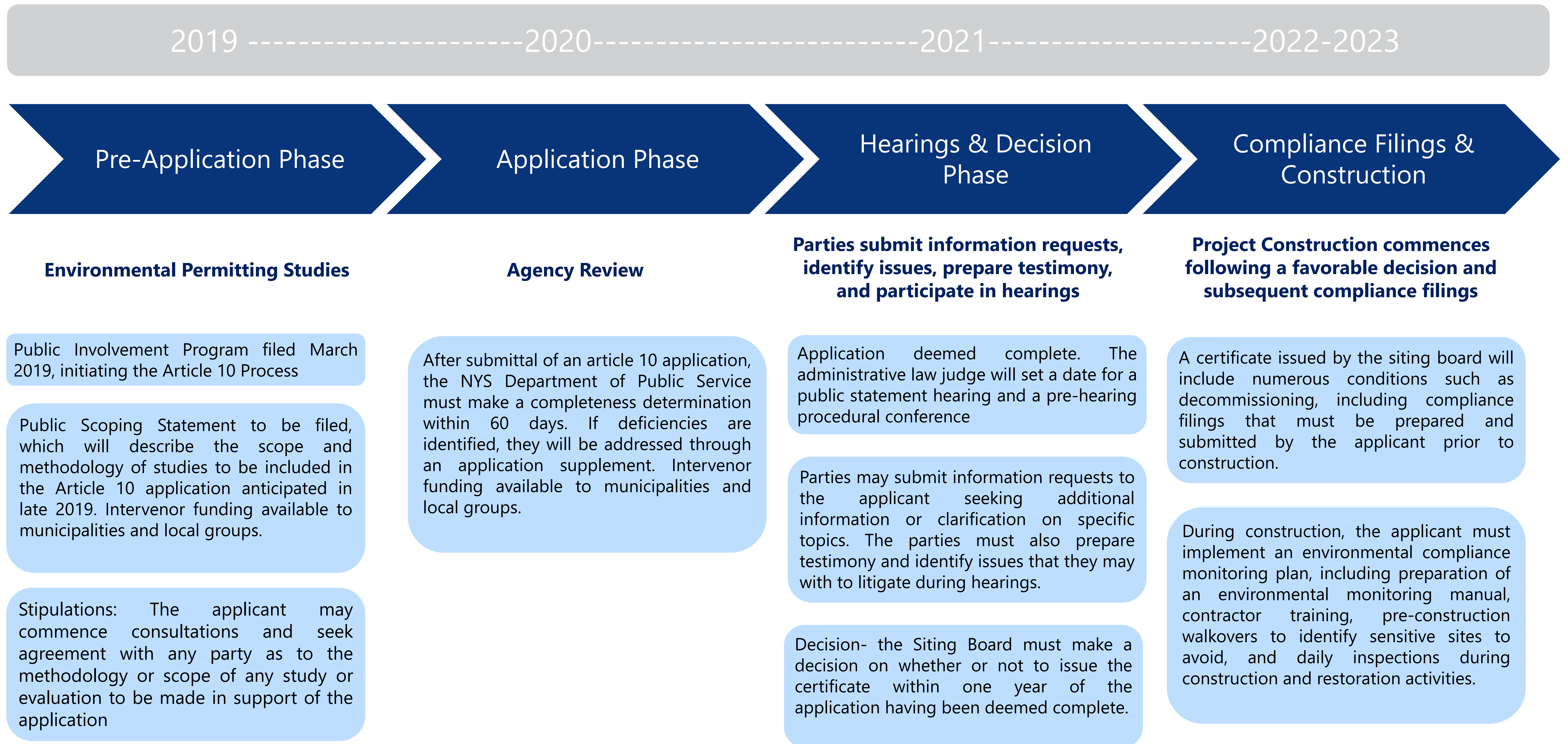


Vegetation After
5 Years



Vegetation After
10 Years

Tracy Solar - Article 10 Timeline

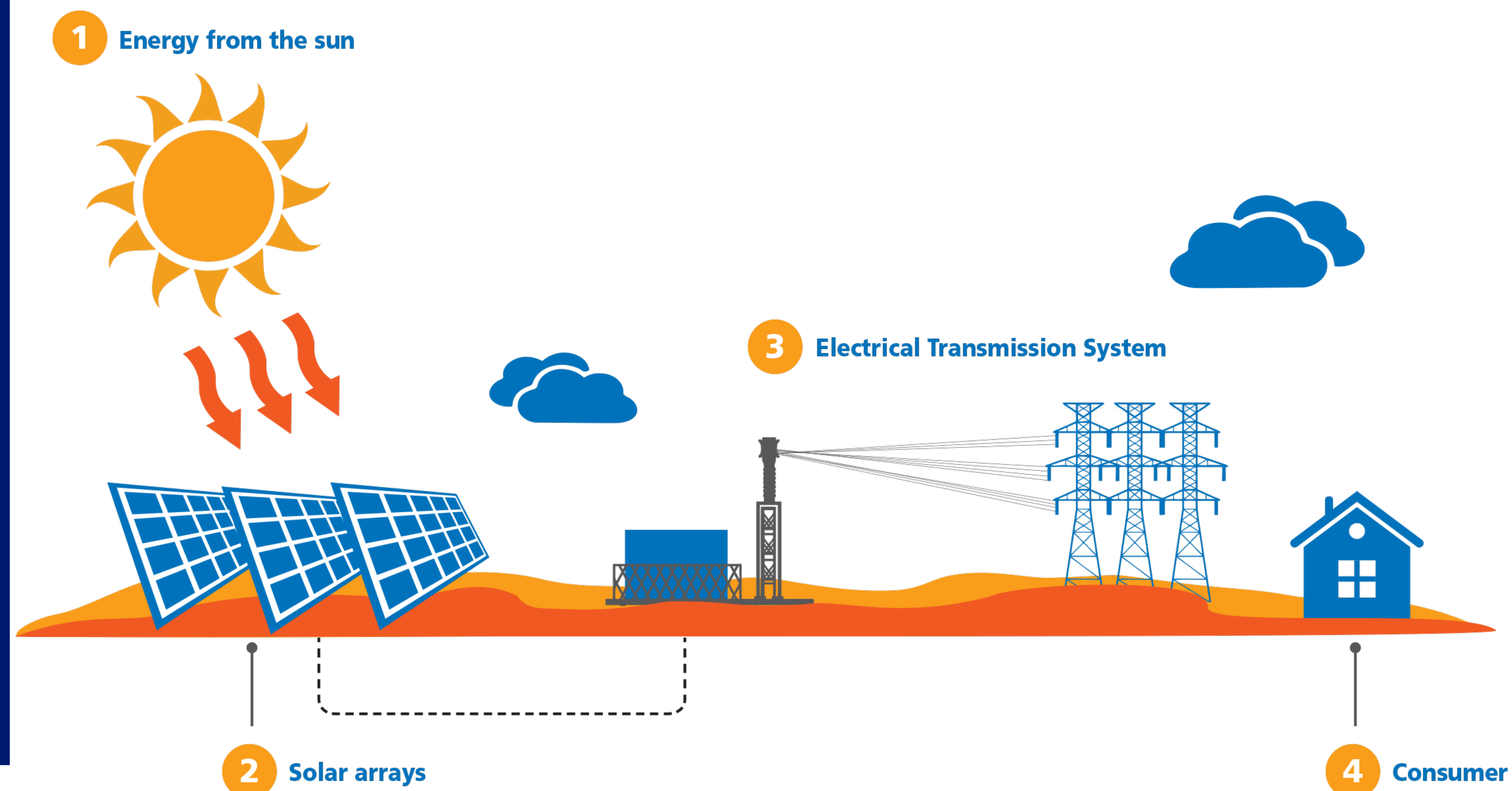


INTERVENOR FUNDING



- Under Article 10, EDF Renewables is required to provide funds for intervenor participation
 - \$350/MW at time the Preliminary Scoping Statement (PSS) is filed – total \$41,650
 - Additional \$1,000/MW at time project Article 10 Application is filed (estimated fall 2019) – total \$119,000
- Following PSS and Application submissions, funds are distributed to parties making a request to cover expenses toward participating in the review and providing feedback on project materials
- At least 50% of the funding is reserved for municipalities
- For more information on intervenor funding, please consult the project website www.tracysolarproject.com or speak to one of the team members at the public meeting

HOW DOES SOLAR ENERGY WORK?



1 Energy from the sun falls onto the earth's surface each day in the form of sunlight. The sunlight is absorbed by the solar panels, converting it into electricity.

2 Solar cells are small, square-shaped silicon semiconductors. Each solar cell is connected into a network of many other solar cells to create a PV (photovoltaic) module or panel. A solar facility is comprised of thousands of panels.

3 The absorbed sunlight is transformed into usable energy by way of an inverter that turns direct current (DC) energy into alternating current (AC) electricity. AC is the form of power used in homes and businesses.

4 Electricity generated travels through transmission /distribution lines to homes and businesses.

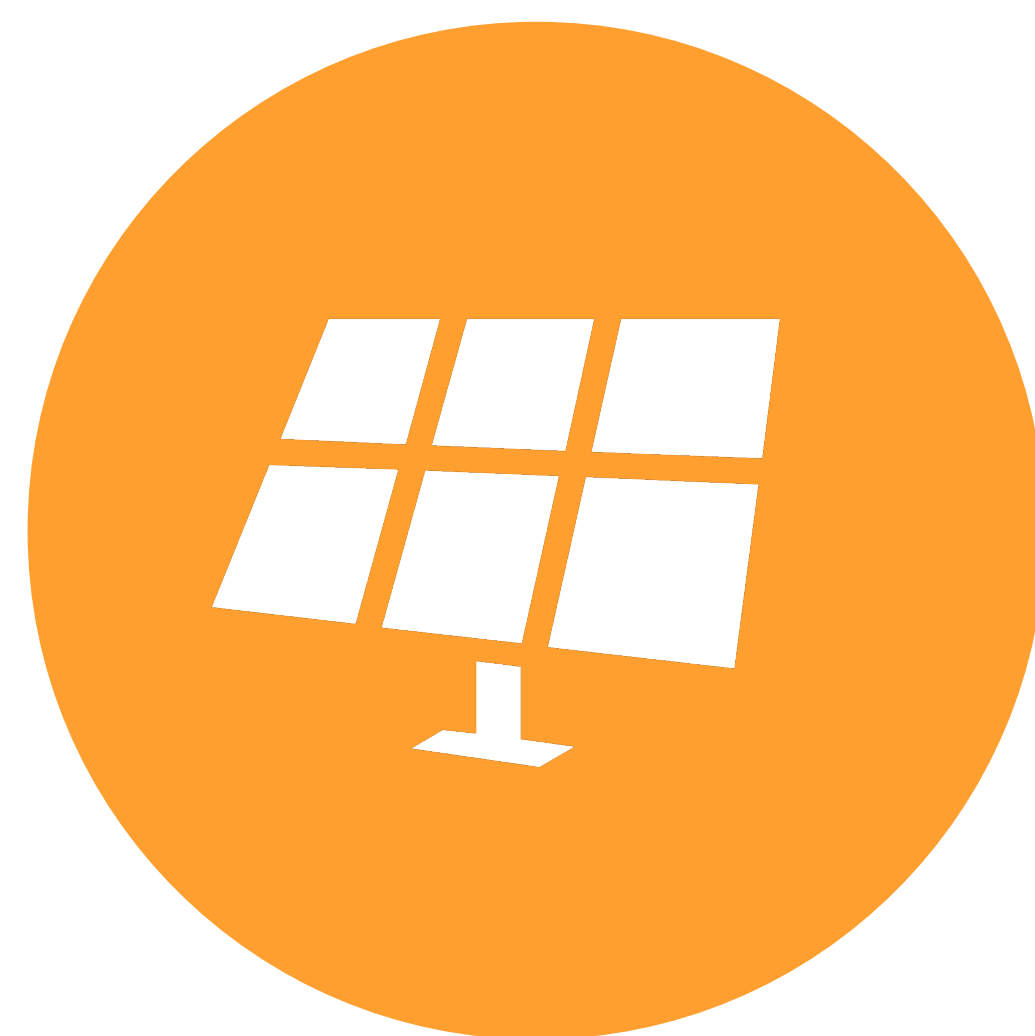


SOLAR PHOTOVOLTAIC PANELS



SOLAR PANELS DO NOT POLLUTE

- No fossil fuels are burned to generate electricity
- No mining or fracking
- No fuel transport required
- No combustion
- No emissions or odors
- No water discharges and no use of neighboring water bodies for heating or cooling



SOLAR PANELS ARE SAFE

- PV panels meet strict electrical safety standards
- PV panel designs are such that they will not leak hazardous materials, even in the case of a fire
- Panels have no moving parts and are expected to last 20-30 years or longer
- Panels that do fail for electrical reasons can be detected and easily changed out (modular design)
- PV panel arrays are fenced to ensure safety and security



SOLAR PARK EQUIPMENT



Racking mounted on piles



Panels installed on racking



Project substation (grid tie)



Inverter/Transformer Skid



Aerial view of project



Land is revegetated

PILING OPTION EXAMPLES

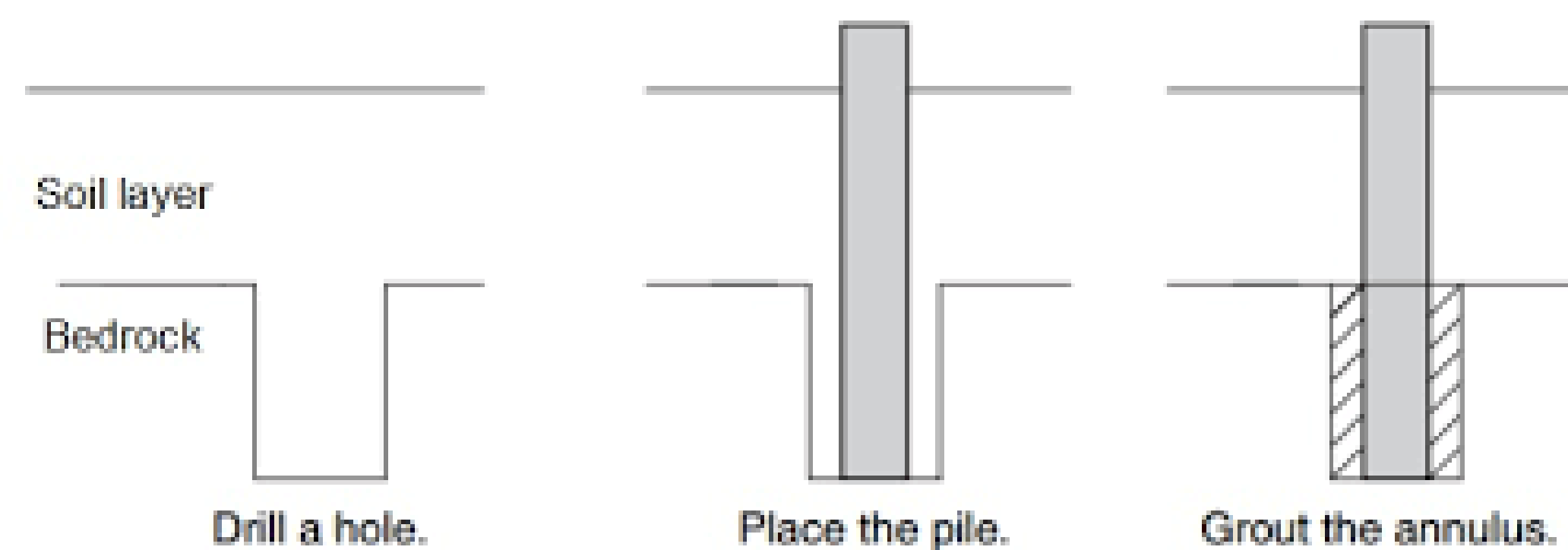
- Helical piles and screw piles are both screwed into the ground at depth of approx. 3' below the frost line (approx. 8' deep)
- Driven piles are hammered into the ground, about 10'-15' deep
- Where bedrock is present, a hole is pre-drilled into the bedrock and the pile is screwed or grouted in place.



Helical Pile Installation
(usually about 10' deep)



Driven Piles



Involves drilling a shallow hole into the bedrock, placing the pile and grouting the pile for stability.

Ground Sockets



Ground Screws

ENERGY STORAGE

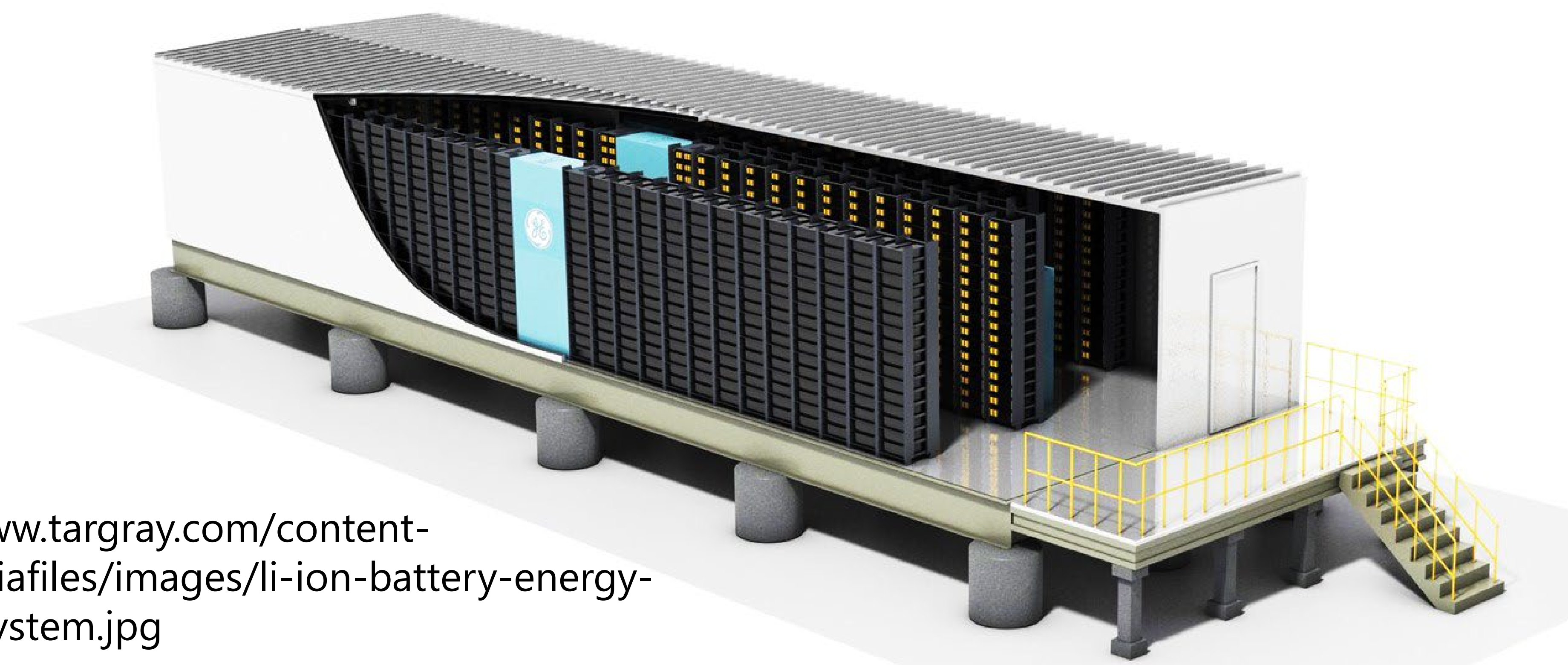
- Project may include energy storage batteries that would be co-located with the inverters within solar panel fields
- Batteries typically installed inside 40 x 8 ft enclosure
- Designed to store electricity until more suitable to inject onto power grid
- More details will be shared later this year



Example of an energy storage battery enclosure (right of picture) and inverter / transformer (left of picture)

<https://3vq5kdns38e1qxlmvvqmrzsi-wpengine.netdna-ssl.com/wp-content/uploads/2018/10/IHI-Energy-Storage-baintree-mass.jpg>

Enclosure contains a series of lithium ion batteries – same technology that powers our electronics and electric vehicles



<https://www.targray.com/content-data/mediafiles/images/li-ion-battery-energy-storage-system.jpg>



CONTACT INFORMATION

Jack Honor
Development Manager
EDF Renewables

(315) 523-7445
www.tracysolarproject.com
Newyork.solar@edf-re.com

