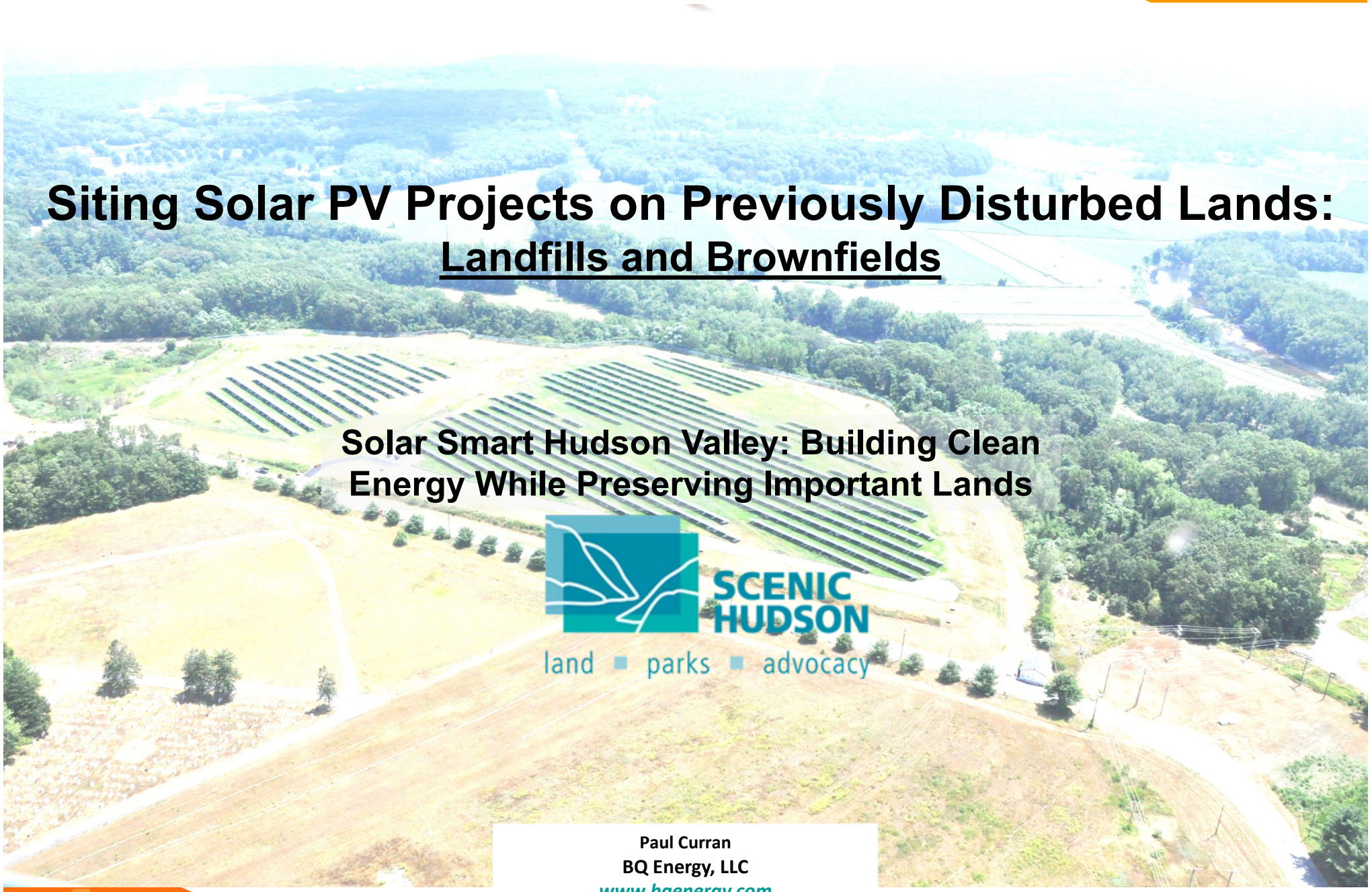

Siting Solar PV Projects on Previously Disturbed Lands:
Landfills and Brownfields

Solar Smart Hudson Valley: Building Clean Energy While Preserving Important Lands

SCENIC HUDSON
land ■ parks ■ advocacy

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BQ Energy, LLC
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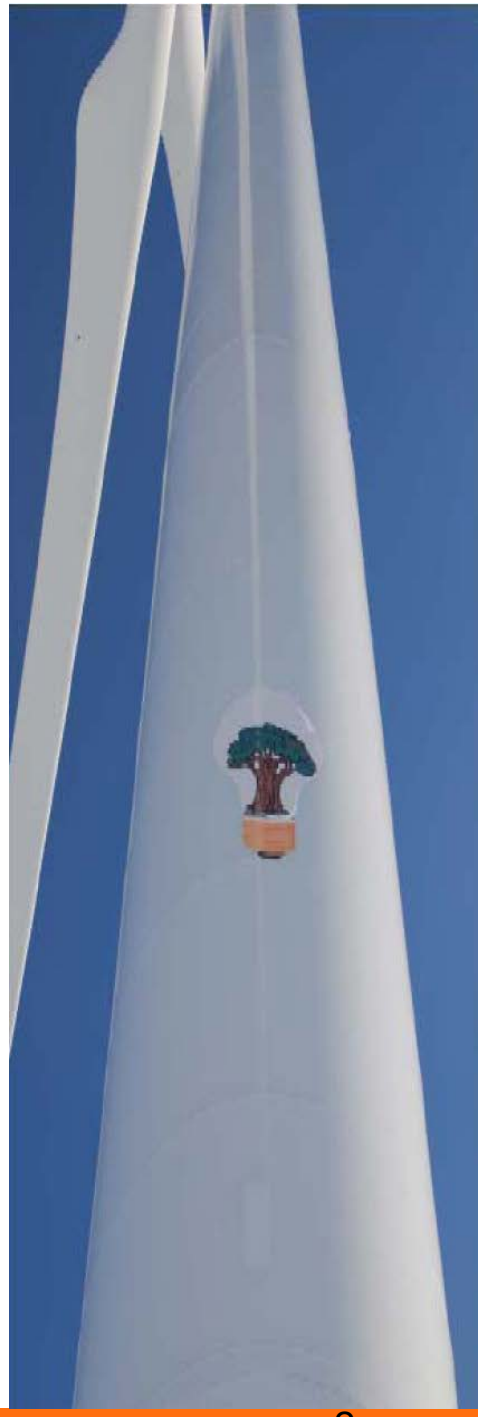
BQ Energy Company Profile

- World-wide experience in project development and a leader in developing renewable energy on brownfields and landfills since 2002.
- Have developed medium-sized wind energy projects (20-50 MW) and utility scale solar PV (1-50 MW).
- We Develop, Build, Own & Operate Projects in many different locations.
- Sell power to owners, third parties, or transmission market….. Or community buyers.
- Office in Wappingers Falls, NY



Samples of Our Experience

Nerefco (2003)

23 MW wind facility located inside an operating oil refinery in the Netherlands

Steel Winds (2006 & 2012)

35 MW Wind facility located on an abandoned steel mill in Lackawanna, NY. Numerous energy and environmental awards

Esopus (2017)

700 KW photovoltaic project on a landfill in Ulster County. 2 MW expansion planned.

PatterSUN(2014)

3 MW photovoltaic facility on a landfill property in Putnam County, NY

Annapolis MD (2018)

18 MW PV Facility in municipal landfill. Largest landfill solar project in the US

What is a landfill??

Solar sits on the surface and does not effect the environmental purpose of the landfill

Design Aspect - Ballasted Foundations

- ✓ Can be Precast or Poured in Place
- ✓ Important to Design for psi loading
- ✓ Important to understand construction plan

- ✓ Consider module height
- ✓ Consider vegetation maintenance
- ✓ Avoid steep slopes
- ✓ Consider landfill drainage

What is a brownfield??

"A brownfield site is any real property where a contaminant is present at levels exceeding the soil cleanup objectives or other health-based or environmental standards, criteria or guidance adopted by DEC that are applicable based on the reasonably anticipated use of the property, in accordance with applicable regulations."
NYS DEC

There are about 3,700 State registered Brownfields and Superfund sites in NYS.

Some Landfill NYS Market Data & Math

- The NYS Department of Environmental Conservation (DEC) says that there are 3,217 closed landfills in New York State.
- An average landfill is around 20 acres (wide variation on this). This would mean there are about 65,000 acres of landfills in NYS.
- A solar project needs about 5 acres for 1 MW of capacity.
- This would mean IF solar energy was installed on every closed landfill in NYS, it could host 13,000 MW of capacity.
- On a typical day NYS needs about 20,000 MW of capacity.
- Niagara Falls and other existing renewables currently supply about 25% of NYS electricity.
- Siting solar on NYS brownfield sites is not included in this math.
- IMPORTANT NOTE- most landfills are not appropriate to be used with solar (eg- too small or too sloped or no power lines)

Local Hudson Valley Projects

Putnam County - Patterson

Dutchess County - Beacon

Ulster County – Esopus

Why Put Solar on Landfills and Brownfields??

- It does take more time to permit.
- It does cost more to build
- It can not sell electricity for more than other projects.

BUT

- There may be existing unused power lines
- The land should be cheaper
- The public acceptance is generally greater

AND

Many US States and the EPA have now recognized the consistency of this method of deploying renewable energy and its consistency with overall public policy and planning.

It's a really good idea…

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