Clean Air Partnership

CLEAN AIR COUNCIL

Renewables Guide for Utility Scale Wind and Solar Projects Webinar Summary

May 1, 2025	Webinar Recording	Slide Deck

Tim Weis from the University of Alberta presented guidance for landowners, local decision makers or community members to help them better understand utility-scale renewable energy including steps in project development, operations and decommissioning of renewable energy in Ontario and questions to ask energy developers. He provided background on the basics of wind and solar energy and what is driving its development, as well as details on the process and steps associated with the development of renewable energy projects. The Landowner Guide For Wind and Solar Project Development in Ontario was developed based on research and conversations with project developers, landowners, and communities regarding renewable energy projects.

Presenters

- Dr. Tim Weis, Professor, Faculty of Engineering, University of Alberta

Key Findings

- Wind and solar prices have gotten very low cost. In recent years, an investment shift with renewable energy projects receiving greater financial backing than fossil fuel projects has emerged, not only in Ontario, but globally.
- Solar energy systems costs are decreasing, but the efficiency and output per module necessitates significant land use for large scale energy needs.
- The prevalent conclusion from research on the health impacts associated with wind and solar farms is that there are no significant health risks associated with the projects.
- Two key factors in siting renewable energy projects are local resource quality and proximity to transmission lines. Public data sources exist to help identify optimal locations. Aligning resource quality with transmission capabilities is critical for the feasibility of renewable projects. Even the most seemingly effective wind resource can be ineffective without a proper method of transportation for the produced energy.
- Landowners and developers should address maintenance access in agreements, and contracts should include detail on maintenance frequency.

Presentation Overview

- Within Ontario, municipalities are taking an active role in overseeing local energy projects and Councils have expressed a need for support to ensure they make informed decisions.

- An interactive slide deck accompanies the 80-page guide to allow for accessibility and easy navigations through topics.
- The efficiency of wind energy generation is determined by the square of the rotor diameter and the cube of wind speed. Through this relationship, larger turbines can generate more power, thereby leading to advancements in turbine size to enhance energy production.
    - As turbine size increases, spacing considerations are crucial for mitigating wake effect – therefore, more space can be required for wind farms to allow for increased energy generation with fewer turbines.
- Solar energy systems are becoming increasingly efficient.
- The tilt of solar panels is critical to maximize exposure to sunlight. Bifacial panels with cells on both sides have been developed to capture reflected sunlight, thereby increasing energy production in a smaller space.
- All energy systems will have associated environmental impacts. Life cycle assessments evaluate the broader environmental impact of renewable energy sources, accounting for materials used to construct technologies and what occurs post-operation, including upstream and downstream emissions.
- Wind and solar energy projects can impact local wildlife, however, climate change and habitat loss are perceived at the most significant macro risks to wildlife, and renewable energy is emphasized as a way to combat climate change.
- Local impacts may include noise and visual disturbances, including solar flicker (occurs when rotating turbines cast moving shadows into neighboring homes).
- One emerging trend is agrivoltaics, which seeks to integrate solar projects with agricultural practices. To optimize this approach, it is important to identify which crops can thrive in shaded environments and benefit from moisture retention. Agrivoltaics also allows livestock to graze underneath solar panels.
- Royalties for landowners can range significantly based on turbine size and local negotiations. Developer-landowner agreements are typically private and not publicly available.
- Besides individual landowner benefits, community agreements may also be established to ensure broader local economic contributions, although these negotiations are often kept confidential by developers.
- The timeline to develop a renewable energy project typically spans a few years, from negotiation to operation. Understanding local resources, negotiating contracts, and securing financing is time consuming, however, actually construction is relatively quick (between 3-9 months).
- Once operational, solar and wind projects usually have purchase agreements lasting approximately 20 years.

- Wind and solar each require a level of maintenance, with solar projects being the lower maintenance of the two. Wind turbines need to be services about 2-3 times per year.

Additional Resources

- Clean Air Partnership Landowners Guide for Utility Scale Wind and Solar Projects
- AMO Municipal Energy Procurement Toolkit
- AMO Navigating Municipal Relations
- Energy Storage Canada: Publications
  - Energy Storage Canada: From Small To Mighty: Unlocking DERs to Meet Ontario's Electricity Needs
  - Energy Storage Canada: Long Duration Energy Storage (LDES) Opportunity Assessment

Contact Information

Please reach out to us at any time with questions, input, or for additional information.

Lauren Patterson, Program Coordinator: lpatterson@cleanairpartnership.org

You can register for upcoming CAP events here.