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Renewable Energy Development: Ecological Fact Sheet for Municipalities

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Alberta's Climate Leadership Plan
has set a target to generate

30%

(CURRENTLY AT 9%)

of electricity from renewable
sources by 2030.

This is an **increase of 21% electric energy from renewables over the course of 13 years**, the equivalent of 5,000 Megawatts (MW).

Meeting this target will result in additional infrastructure on the landscape and much of the production will occur in rural Alberta, where rural municipalities make important land use decisions.



Are there ecological impacts related to renewable energy development?

From an environmental perspective renewable energy has many benefits over conventional energy development, particularly when it comes to air and water. However, there will be impacts to land and wildlife that need to be carefully considered and mitigated.

- **Air:** Wind and solar developments are important solutions (no toxic pollutions or greenhouse gas emissions in production although, minimal amount generated during production of materials) to the energy dilemma of reducing greenhouse gas emissions, such as carbon dioxide, sulfur dioxide and nitrogen dioxide, common by-products of more traditional forms of energy development such as coal, oil and natural gas that are contributing to a changing climate.
- **Water:** There is minimal impact on water resources during wind farm development and operations, although some water is used during production of materials. Solar developments can have direct impacts on the hydrology (alteration of the drainage channels and increased run off and erosion) of the local area.
- **Landuse:** There will be a direct impact to land from wind turbine pads or solar panels, access roads, substations and transmission lines. The average land use need to generate a 1 MW of energy is:
 - 60 acres per MW for wind farms on land; and
 - 4 acres per MW for solar PV power plant.

The extent of the impact on environment will depend greatly on the location of the projects, and the amount of associated infrastructure (transmission lines, access roads) needed.

- **Wildlife:** Impacts to wildlife populations will depend on the siting of renewable energy projects. Key concerns are direct habitat loss due to placement of infrastructure and fragmentation leading to changes in patterns relating to movement, breeding or foraging and mortality. Wind turbines and solar panels can be hazardous to bats and birds via direct mortality from flying into the turbines/panels.

environmental impact of renewable energy development?

All large scale wind and solar development require a permit from Alberta Utility Commission (AUC) that includes consideration of ecological impacts as outlined by Alberta Environment and Parks (AEP) wind and solar directives. AEP has developed guidelines for proponents and review and comment on development projects. However, there are important roles a rural municipality can play in helping to reduce the ecological impacts.

- **Siting:** Reducing ecological impacts on land and wildlife is best achieved through careful siting of wind and solar farms. AEP (link below) has developed a renewable energy and wildlife sensitivity map. Some rural municipalities have undertaken strategic level planning to guide wind and solar developers on where this type of development is most desirable and where to avoid. Other municipalities have specifically outlined areas to avoid (i.e. environmentally significant areas) in bylaws.
- **Construction, Operations and Decommissioning:** A number of rural municipalities have developed bylaws that outline expectations from an ecological perspective around construction, operations and decommissioning.

AEP has developed a list of ecologically sensitive areas where they recommend avoiding renewable energy development:

- Grasslands
- Old growth forest stands
- Named water bodies
- Valley breaks
- Valleys of large permanent water courses
- Wildlife sensitivity areas and/or specified wildlife zones

What resources can help navigate renewable energy development from an ecological perspective?

- **AEP Wind Wildlife Directives:** summarizes potential wildlife issues associated with wind energy projects and provides direction for minimizing effects to wildlife and wildlife habitat during siting, construction, and operation of wind energy projects.
- **AEP Wind Energy External Checklist A:** checklist of documents needed for AEP to review and provide comment as part of the AUC application submission to acquire a permit.
- **AEP Solar Wildlife Directives:** summarizes potential wildlife issues associated with solar energy projects and provides direction for minimizing effects to wildlife and wildlife habitat during siting, construction, and operation of solar energy projects
- **AEP Solar Energy Submission Checklist:** this checklist outlines the information necessary to ensure completeness relative to AEP requirements for solar energy development applications to AUC.
- **Prairie Conservation Forum BMP for wind development:** the beneficial management practices provided are built on minimal disturbance principles, guidelines and tools developed by the GOA for all industrial activity proposed in native prairie and parkland landscapes.
- **Renewable Energy and Wildlife Sensitivity Map:** map includes four categories; critical wildlife, high risk, moderate risk and lower risk. Critical areas must be avoided for renewable energy projects. Areas of high risk require increased pre-assessment work, mitigation and specialized construction or operation techniques/rules.

