Permitting Processes for Solar Photovoltaic Systems in Montana

Prepared for the Montana Department of Environmental Quality
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July 2013

Executive Summary

Solar photovoltaic (PV) markets are expanding rapidly, and there is now enough solar PV capacity in the U.S. to power more than 1.2 million households. In Montana, the number of solar PV systems has increased from a handful in 1999 to more than 1,000 today.

Permitting processes for solar PV systems are essential to ensure public safety and system performance. Depending on the jurisdiction, installation of a solar PV system may require an electrical permit, a building permit, zoning approval, or some combination of these. In Montana, the state and 46 local governments are involved in permitting for solar PV systems.

The U.S. Department of Energy has identified streamlined permitting processes for solar PV systems as an important component of its efforts to accelerate the growth of PV markets. This report gathers information on permitting processes for solar PV systems from Montana's 47 permitting jurisdictions in order to assess whether opportunities for streamlining exist in the state.

The report finds that permitting processes vary widely among permitting jurisdictions in Montana. Electrical permits are required for all residential solar PV systems in Montana. In some jurisdictions, building and/or zoning permits are also required. Permit fees range from $40 to more than $400, and turnaround times range from less than one day to as much as four weeks. One Montana permitting jurisdiction – Bozeman – has a solar-specific component of its permitting process.

Report findings indicate that there is significant potential for streamlining residential solar PV permitting processes in Montana while ensuring public safety and high-quality solar PV installations. Resources exist to assist jurisdictions that are interested in streamlining their solar PV permitting processes. One good example is the "Expedited Permit Process for PV Systems" developed by the Solar America Board for Codes and Standards (Brooks 2012).

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Introduction

Solar photovoltaic (PV) markets have expanded rapidly in recent years. Today, the United States has more than 7,700 megawatts of solar PV capacity, which is enough to power more than 1.2 million households (Solar Energy Industries Association 2013). The majority of solar PV systems are small-scale residential and commercial systems, known as "distributed" energy resources to distinguish them from large centralized power plants.

In Montana, the number of distributed solar PV systems has increased from a handful in 1999, when Montana's net-metering law was passed,[1] to more than 1,000 today.

Distributed solar PV systems offer many benefits to the U.S. as a whole and to Montana in particular. Because they are located at or near sources of energy demand (i.e., homes or businesses), distributed energy resources can reduce transmission line losses and ease congestion on the transmission system. The reduced reliance on centralized power plants and transmission lines increases U.S. energy security by making the grid more resilient in the case of outages or attacks. By displacing electricity generated by coal or natural gas, distributed solar PV systems reduce emissions of greenhouse gases and other air pollutants.

In Montana, business has grown to meet the demand for distributed solar PV systems. Today, more than 50 small businesses across the state sell and install renewable energy systems, contributing more than $10 million to Montana's economy. To individual homeowners and business owners, distributed solar PV systems offer the economic benefits of lower electric bills and higher property values.[2]

The U.S. Department of Energy and other national organizations have identified the streamlining of local permitting processes as an important component of their efforts to expand the adoption of solar PV technology. The purpose of this report is to examine current solar permitting practices in Montana in order to assess whether opportunities for streamlining exist in the state.

Background

History of U.S. Building Codes

Building codes exist to protect public health, safety, and welfare by ensuring that buildings are constructed adequately. In the United States, building and electrical codes are the responsibility of state and local governments.

U.S. cities and states began to enact building codes in the 19th century, and by the early 20th century three regional organizations had been established to develop "model" building codes that were used

[1] Montana's net-metering law requires the state's largest utility to allow customers to connect small solar, wind, and hydroelectric systems to the grid, and to give the system owners credit on their electric bills for the excess power they produce. Montana Code Annotated 69-8-601 to 605.

[2] A study on the impact of solar PV on property values in California found that solar PV systems increase the sale price of homes by between $3.90 and $6.40 per watt, or approximately $17,000 for an average-sized 3.1 kW solar PV system (Hoen et al. 2011).

throughout their respective regions of the country: the Building Officials and Code Administrators International in the East and Midwest, the International Conference of Building Officials in the West, and the Southern Building Code Congress International in the South. These three regional organizations merged in 1994 to form the International Code Council (ICC), which develops model codes for use by states and local governments throughout the country. The ICC develops more than a dozen codes, covering building, plumbing, mechanical, energy conservation, and other topics. Codes are updated every three years.

Similarly, as electricity came into widespread use in the late 19th century, several sets of electric codes were developed to address the risks of fire and electric shock. These standards were unified in 1897 with the creation of the National Fire Protection Association (NFPA), which develops the National Electric Code (NEC). Like ICC codes, the NEC is updated every three years.

Today, there are approximately 20,000 permitting jurisdictions in the U.S. (U.S. Census Bureau 2013). Most jurisdictions adopt model codes developed by ICC and NFPA rather than writing their own codes.

Building Codes in Montana

In Montana, the Building and Measurement Standards Bureau establishes and enforces building, plumbing, mechanical, electrical, energy, elevator, and boiler codes for the state (known collectively as "building codes"). The 2011 edition of the National Electric Code[3] and versions of six ICC codes[4] are currently in force in Montana.

Montana law authorizes counties, cities, and towns to enforce their own building, electrical, plumbing, and mechanical codes, with approval from the state.[5] Many local jurisdictions choose to enforce some or all of these codes. Codes adopted by local governments must be the same as the state's codes, though local governments can establish their own permit fees. Permit fees charged by local governments must be "necessary, reasonable, and uniform," and used only for building code enforcement purposes.[6] Most permitting jurisdictions in Montana cover the costs of permit review and inspections solely through permit fees; the remaining jurisdictions cover these costs through a combination of permit fees and local general fund expenditures.

The state has authority to enforce building codes in areas for which local enforcement does not apply. If a local jurisdiction is approved to enforce select building codes, the state retains authority over all remaining codes within the jurisdiction.

Forty-six local governments in Montana have adopted the state building codes. Of these, 40 are cities or towns and six are counties. Twenty-six have adopted only building codes, one has adopted only

[3] Administrative Rules of Montana section 24.301.401

[4] The International Building Code (2009), International Residential Code (2006), International Energy Conservation Code (2009), International Existing Building Code (2009), International Mechanical Code (2009), and International Fuel Gas Code (2009). Administrative Rules of Montana sections 24.301.131; 24.301.154; 24.301.161; 24.301.171; 24.301.172; 24.301.173.

[5] Montana Code Annotated section 50-60-302, Administrative Rules of Montana section 24.301.201 to 24.301.231

[6] Montana Code Annotated section 50-60-106

electrical codes, and the remainder have adopted multiple codes. Most local building codes apply to both residential and commercial buildings, though a few apply to only one building type or the other. The complete list of local government building codes and officials is available through the Montana Building and Measurement Standards Bureau and is included in Appendix A.

Building Codes for Solar PV Systems

Components of a grid-connected, net-metered residential solar PV system include (1) the PV modules (panels), which make use of a semiconductor (usually silicon) to convert photons of sunlight to a flow of electrons; (2) one or more inverters to convert the direct current (DC) produced by the solar panels to alternating current (AC); and (3) a mounting system to attach the modules to the roof, pole or ground.

For permitting purposes, solar PV systems are generally considered electrical projects, and an electrical permit is required. Solar PV systems are covered in Article 690 of the National Electric Code.

Some jurisdictions also require building permits for solar PV systems to ensure that the roof can handle the system's weight, that the system is properly secured to the roof, and that it is not prone to wind damage or roof leakage. In some jurisdictions, solar PV systems must also undergo zoning or planning department review to address such issues as height, setback, lot coverage, and/or aesthetics.

In addition to local and/or state permitting requirements, solar PV systems must be approved by the local utility before they can be connected to the electric grid. Utility interconnection rules are beyond the scope of this report.

National Efforts to Streamline Solar Permitting

The wholesale cost of solar modules has decreased by two-thirds since 2008, to around $1/watt (Barbose et al., 2012). The costs of inverters and mounting systems are coming down as well, though more slowly. As a result, non-hardware "soft costs," which include system design, installation labor, marketing, and permitting, account for an increasing percentage of the price of solar PV systems (Ardani et al., 2012).

Reducing the soft costs of solar PV is a major focus of the U.S. Department of Energy and other national organizations that aim to accelerate U.S. solar market growth. One component of this effort is reducing permitting costs by streamlining permitting processes for solar PV.

For example, reducing permitting and inspection costs and streamlining permitting processes is a key component of the U.S. Department of Energy's SunShot Initiative, which was launched in 2011 with the goal of making solar energy cost-competitive with other electricity sources by the end of the decade. The SunShot Vision Study states that "inconsistency of codes and standards between jurisdictions and lack of familiarity of states and municipalities with solar technologies present obstacles to the efficient deployment of solar systems" (U.S. Department of Energy, 2012). Through the SunShot initiative, the U.S. Department of Energy is funding a number of projects intended to reduce permitting, inspection, and interconnection costs for solar.

The U.S. Department of Energy has also developed several resources to help local governments encourage the adoption of solar technology in their communities. "Solar Powering Your Community: A Guide for Local Governments" (U.S. Department of Energy, 2011) includes information about solar-friendly policies, financing mechanisms, utility processes, and public education programs. One of the guide's recommendations is streamlined solar permitting processes.

The Solar America Board for Codes and Standards has developed an "Expedited Permit Process for PV Systems" up to 15 kW in size (Brooks, 2012). This expedited permit process is intended to simplify permit applications and review processes, taking advantage of the common characteristics of most small solar PV systems. It is designed to apply to solar PV systems in which both the structural and electrical design of the system meet specified criteria.[7] The expedited permitting process requires that the applicant submit the following: a permit application, a site diagram, an electrical diagram, and the specification sheets and simple instruction manuals for major components. A standard electrical diagram is included as part of the expedited permit process in order to simplify and streamline the permit review process.

Permit Fees for Solar PV

Closely tied to the streamlining of solar permitting processes are efforts to ensure that permit fees are appropriate for solar PV projects. Generally, building and electrical permit fees are determined in one of two ways: (1) a flat fee per project, or (2) a fee based on the dollar value of the project ("valuation-based"). Less common are fees based on the square footage of the project.

The "Expedited Permit Process for PV Systems" (Brooks, 2012) includes the following recommendation regarding permit fees for solar PV projects.

> Costs for permits are often based on the overall project cost. This works well for many conventional projects because this accurately represents the scale of the project. However, with a PV installation, the equipment costs are much higher than with other projects of similar scope. It is therefore recommended that an alternative permit fee scale be used for PV system installations.

In other words, valuation-based permit fees are based on the principle that costlier projects are larger projects, requiring more time and effort on behalf of plan reviewers and inspectors and thus warranting a larger permit fee. Though this principle is valid for most types of construction, it may not apply well to solar projects. Solar modules and inverters are costly, so the total cost of a solar project tends to be significantly higher than the total cost of another type of construction project of a similar scale. Valuation-based fee structures can therefore lead to inflated permit fees for solar projects.

[7] Structural criteria: (1) the array is mounted on a code-compliant structure; (2) an engineered mounting system is used to attach the array to the structure; and (3) the array has a distributed weight of less than 5 lbs/sq ft and less than 45 lbs per attachment. Electrical criteria: (1) all products are listed and identified for the application; (2) the array is composed of 4 series strings or less; and (3) the inverter output is 13.44 kW or less (maximum size for 70 amp breaker) and is connected on the load side of the service disconnect. The authors of the expedited permit process state that 50-75% of residential solar PV projects in the U.S. meet these criteria, and they specify additional recommended permitting steps for projects that do not. See Brooks (2012) for details.

For this reason, the "Solar Powering Your Community" guide (U.S. Department of Energy, 2011) recommends that local governments "consider instituting a flat-fee method [for solar projects] that reflects the actual costs of issuing the permit."

The Role of This Study

Many resources exist to help local governments streamline their permitting processes for solar PV systems, including those described in the previous sections. However, in order to apply these resources effectively, it is necessary to understand current solar permitting practices. This study gathers information on solar PV permitting practices across Montana's 47 permitting jurisdictions in order to assess the potential for streamlining such practices to boost solar markets in Montana.

Methods

The study authors contacted building officials in each of the 47 permitting jurisdictions in Montana, including 46 certified local governments and the State Building Codes Bureau. We were able to obtain information from 46 of these 47 jurisdictions. Each building official was asked the same questions regarding their jurisdiction's permitting policies as they relate to solar PV projects, as well as small wind turbines and micro-hydropower projects. A list of the information requested from each permitting jurisdiction is included in Appendix B. In several cases, we also spoke with zoning or planning department officials about zoning requirements for renewable energy systems. See the References section for a complete list of officials from whom information was obtained.

The authors also spoke with six installers of renewable energy systems about their experiences with various jurisdictions' permitting processes for solar PV, wind, and micro-hydropower systems. The six installers were selected based on geographic diversity. The list of questions posed to each installer is included in Appendix C, and a list of the installers contacted is included in the References section.

The next section summarizes solar PV permitting requirements in Montana. Permitting requirements for small wind turbines are described in Appendix D, and notes on micro-hydro permitting are included in Appendix E.

Solar PV Permitting Requirements

The following sections summarize state and local building, electrical, and zoning permit requirements for solar PV systems. Table 1 compares permit fees for three hypothetical residential solar PV systems in Montana's six largest cities, and Table 2 displaying the permit(s) required, turnaround times, and method for determining permit fees in all 47 permitting jurisdictions.

State of Montana Requirements – Electrical Permits

The State of Montana does not issue building permits for residential buildings of less than five units constructed outside of local code enforcement jurisdictions. Residential solar PV systems in the state's jurisdiction therefore require only an electrical permit. State electrical permits for residential projects, including solar PV projects, can be obtained by filling out an online form and paying $45. Either the

homeowner or an electrical contractor can apply for the permit. The process is completed with an inspection by the state electrical inspector assigned to that region of the state.

Commercial solar PV projects in the state's jurisdiction require both a building permit and an electrical permit. The State Building Codes Bureau recommends that commercial solar PV project owners contact the state building inspector who covers their region of the state. The inspector will come to the site, review the plans, and issue the building permit onsite. The alternative is to submit a permit application and plans to the Building Codes Bureau in Helena, but this would involve a 2-3 week review time. Commercial building permit fees are valuation-based; for example, for a $20,000 project, the fee would be $321.25. The building permit fee is calculated based on the entire cost of the project, including the cost of the solar PV equipment.

State electrical permits for commercial projects can be obtained online by an electrical contractor. Alternatively, the electrical permit can be obtained in the field by calling the state electrical inspector to the site. Electrical permit fees are valuation-based and should be calculated based on the cost of the electrical work (i.e., the connection to the electric grid), not the total project cost.

Local Government Requirements – Building and Electrical Permits

Permit Required

In Montana, 42 local governments issue building permits for residential projects. An overlapping, but not identical, set of 42 local governments issue building permits for commercial projects. We were able to obtain information from 41 of the 42 jurisdictions in each of these two categories.

Most local governments that issue building permits require permits for solar PV systems under at least some conditions. Of the 41 jurisdictions that issue residential building permits and from which we obtained information, 15 require a building permit for all residential solar PV systems. In an additional 19 jurisdictions, a building permit is required for residential solar PV systems under certain conditions, e.g., only if roof modification is required, or for roof-mounted systems but not ground/pole-mounted systems. The remaining 7 jurisdictions do not require a building permit for solar PV systems under any conditions.

Commercial PV systems are more likely than residential PV systems to require building permits. Of the 41 local governments that issue commercial building permits and from which we were able to obtain information, 21 of them require a building permit for all commercial solar PV systems. In an additional 16 local governments, a building permit is required under certain conditions. The remaining 4 local governments issue commercial building permits but do not require building permits for commercial solar PV systems.

As for electrical permits, 13 local governments are certified to issue residential electrical permits in their jurisdictions, and 12 are certified to issue commercial electrical permits. All of them require electrical permits for solar PV systems.

Permitting Process

The steps involved in obtaining a building permit are relatively uniform across jurisdictions. In all cases,

the homeowner is required to submit an application and plans, pay a fee, and undergo one or more inspections.

The primary difference between the building permit process for residential and commercial PV systems is that most jurisdictions require that plans be stamped by a licensed architect or engineer for commercial projects. Only a handful of jurisdictions require this for residential projects.[8]

Electrical permits can be obtained over-the-counter in some jurisdictions (e.g., Billings, Missoula) while others require more review time (e.g., Great Falls).

Turnaround Time

On average, turnaround times for commercial building and electrical permits are slightly longer than for residential permits. Average turnaround times are 4-6 days for residential solar PV systems and 6-9 days for commercial solar PV systems.

However, turnaround times for both residential and commercial projects are quite variable, ranging from less than one day to as much as four weeks.

Permit Fees

Building permit fees are based on the dollar value of the project in nearly all jurisdictions. A handful of jurisdictions have flat building permit fees or fees based on the square footage of the project.

On the other hand, roughly half of the jurisdictions that issue electrical permits have flat electrical permit fees; the other half are valuation-based. Flat electrical permit fees range from $40 to $120.

Some jurisdictions, recognizing that high cost of solar PV equipment tends to inflate valuation-based permit fees, allow permit fees for solar projects to be calculated excluding the cost of the solar equipment. Most jurisdictions lack an explicit policy on this matter.

Table 1 displays permit fees for three hypothetical residential solar PV projects in each of Montana's six largest cities.

[8] Jurisdictions that require engineered plans for commercial PV systems include Billings, Darby, Forsyth, Glasgow, Glendive, Great Falls, Hamilton, Hardin, Helena, Lewistown, Miles City, Missoula, Missoula County, Ronan, and Stevensville. Jurisdictions that require engineered plans for residential PV systems include Darby, Missoula County, and Stevensville.

Table 1. Permit Fees for Three Hypothetical Residential Solar PV Projects

Permitting Jurisdiction	Project A: 2.4 kW Roof-Mount*			Project B: 4.2 kW Pole-Mount**			Project C: 9.2 kW Roof-Mount***		
	Building	Electrical	Total Fee	Building	Electrical	Total Fee	Building	Electrical	Total Fee
Billings	$137.50 (based on full project cost)	$40 (flat)	**$177.50**	$211.50 (based on full project cost)	$40 (flat)	**$251.50**	$343.55 (based on full project cost)	$40 (flat)	**$383.55**
Bozeman	$168.30 (based on non-electrical costs)	$26.75 (based on electrical costs)	**$195.05†**	$254.93 (based on non-electrical costs)	$34.25 (based on electrical costs)	**$289.18†**	$419.93 (based on non-electrical costs)	$42 (based on electrical costs)	**$461.93†**
Butte	N/A	$80 (flat)	**$80**	N/A	$80 (flat)	**$80**	N/A	$80 (flat)	**$80**
Great Falls	N/A	$352.06 (based on full project cost)	**$352.06**	$93.79 (based on pole and foundation cost)	$364.56 (based on balance of project cost)	**$458.35**	N/A	$479.56 (based on electrical costs)	**$479.56**
Helena	$159.12 (excludes PV equipment cost)	$56 (flat)	**$215.19**	$178.99 (excludes PV equipment cost)	$56 (flat)	**$234.99**	$198.79 (excludes PV equipment cost)	$56 (flat)	**$254.79**
Missoula	N/A	$53 (flat)	**$53**	$409 (based on full project cost)	$53 (flat)	**$462**	N/A	$53 (flat)	**$53**

* Project A: 2.4 kW roof-mount, total cost before incentives $12,000. Cost breakdown: PV module $3,500; inverters, racking and other equipment $4,000; electrical $1,500; labor $3,000. No structural modification needed to the roof.

** Project B: 4.2 kW pole-mount, total cost before incentives $19,500. Cost breakdown: PV module $6,000; inverters, pole mount and other equipment $8,000; electrical $2,000; labor $3,500.

***Project C: 9.2 kW roof-mount, total cost before incentives $37,500. Cost breakdown: PV module $15,500; inverters, racking and other equipment $15,500; electrical $2,500; labor $4,000. No structural modification needed to the roof.

†Plus $100 for planning department review if in overlay district (Bozeman).

Local Government Requirements – Zoning Permits

In most of the state, an electrical permit and, in some cases, a building permit, are the only permits required to install a solar PV system. However, a few cities have additional zoning permits that apply to solar PV projects.

In Bozeman, any exterior change to a building in the so-called "overlay district," which includes the historical area and main corridors, requires review by the Planning Department for a Certificate of Appropriateness. This review process costs $100 and takes from 1-6 weeks.

In Cut Bank, PV projects require a zoning permit, which costs $20 and takes less than one week.

In Colstrip, ground-mounted residential PV systems require a zoning permit, which costs $15 and takes 1-2 days.

In Great Falls, commercial PV projects must go through the Design Review Board for aesthetic considerations. There is no fee associated with this process, which takes 2-4 weeks.

Several other jurisdictions require that PV systems meet zoning requirements (height, setback, etc.) but do not require a zoning permit.

Solar PV-Specific Requirements

Bozeman is the only permitting jurisdiction in Montana that has solar-specific component of its permitting requirements: a "PV System Checklist" that must be submitted, along with a site diagram and one-line electrical diagram, in addition to the building permit application. The PV System Checklist requires the installer to provide information about the inverter, PV module and array, wiring and overcurrent protection, and roof or ground-mounting structure.

Table 2. Solar PV Permitting Requirements

		Residential Solar PV Permitting			Commercial Solar PV Permitting		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**
Anaconda-Deer Lodge County	Building	None	-	-	None	-	-
Belgrade	Building	Building (roof modification)	1-2 weeks	Building: Valuation	Building (roof modification)	1-2 weeks	Building: Valuation
Billings	Building, Electrical	Building, Electrical	3-7 days	Building: Valuation; Electrical: $40	Building, Electrical	4 weeks	Building, Electrical: Valuation
Bozeman	Building, Electrical	Building, Electrical, Zoning permit if in overlay district	2-3 weeks	Building, Electrical: Valuation; Zoning (if in overlay district): $100	Building, Electrical, Zoning permit if in overlay district	2-4 weeks	Building, Electrical: Valuation; Zoning (if in overlay district): $100
Butte-Silver Bow County	Building, Electrical	Electrical	Same day	Electrical: $80	Electrical	Same day	Electrical: $80
Choteau	Building	Building	5 days	Building: Valuation including cost of PV equipment	Building	5 days	Building: Valuation including cost of PV equipment
Colstrip	Building (residential only)	Building (possibly), Zoning permit (ground-mount)	2-3 days	Building: Based on square footage; Zoning: $15	Zoning permit (ground-mount)	-	-
Columbia Falls	Building, Electrical	Building (roof-mount only), Electrical	3 days	Building: $75-100; Electrical: $120	Building (roof-mount only), Electrical	3 days	Building: $75-100; Electrical: $120
Conrad	Building	Building	5 days	Building: Valuation including cost of PV equipment	Building	5 days	Building: Valuation including cost of PV equipment
Cut Bank	Building	Building (roof-mount), Zoning permit	5-7 days	Building: Valuation excluding cost of PV equipment; Zoning: $20	Building (roof-mount), Zoning permit	5-7 days	Building: Valuation excluding cost of PV equipment; Zoning: $20
Darby	Building	Building	1 week	Building: Valuation	Building	1 week	Building: Valuation
East Helena	Building, Electrical	Building, Electrical	2 weeks	Building, Electrical: Valuation	Building, Electrical	2 weeks	Building, Electrical: Valuation

		Residential Solar PV Permitting			Commercial Solar PV Permitting		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required ** **	**Typical Turnaround**	**Permit Fees†**	**Permit(s) Required ** **	**Typical Turnaround**	**Permit Fees†**
Forsyth	Building	Building	Same day	Building: Valuation	Building	1 week	Building: Valuation
Fort Benton	Building	Building (ground-mount)	Same day	Building: Based on square footage	Building (ground-mount)	Same day	Building: Based on square footage
Glasgow	Building	Building	2 weeks	Building: Valuation excluding cost of PV equipment	Building	2 weeks	Building: Valuation excluding cost of PV equipment
Glendive	Building	None	-	-	Building	2 weeks	Building: Valuation
Great Falls	Building, Electrical	Building (roof modification or ground-mount), Electrical	3-5 days	Building: Valuation excluding cost of PV equipment; Electrical: Valuation including cost of PV equipment	Building (roof modification or ground-mount), Electrical, Design Review Board	1-2 months	Building: Valuation excluding cost of PV equipment; Electrical: Valuation including cost of PV equipment
Hamilton	Building	Building (roof modification)	5-10 days	Building: Valuation excluding cost of PV equipment	Building (roof modification)	5-10 days	Building: Valuation excluding cost of PV equipment
Hardin	Building	Building	Same day	Building: Valuation	Building	1 day if straightforward, otherwise 1-2 wks	Building: Valuation
Havre	Building	Building (roof modification)	10 days	Building: Valuation	Building (roof modification)	10 days	Building: Valuation
Helena	Building, Electrical	Building, Electrical	5-7 days	Building: Valuation excluding cost of PV equipment; Electrical: $56	Building, Electrical	10 days	Building: Valuation excluding cost of PV equipment; Electrical: Valuation including cost of PV equipment
Hysham	Building	None	-	-	None	-	-
Kalispell	Building	Building	2-5 days	Building: Valuation	Building	2-5 days	Building: Valuation
Laurel	Building	None, but engineered plans required	Same day	-	None, but engineered plans required	Same day	-
Lewistown	Building (commercial only)	None	-	-	Building	2-3 weeks	Building: Valuation

		Residential Solar PV Permitting			Commercial Solar PV Permitting		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**
Libby	Building	Building (pole-mount)	5-7 days	Building: Valuation excluding cost of PV equipment	Building (pole-mount)	5-7 days	Building: Valuation excluding cost of PV equipment
Livingston	Building	Building (roof modification)	2-3 days	Building: Valuation excluding cost of PV equipment	Building (roof modification)	2-3 days	Building: Valuation excluding cost of PV equipment
Malta	Building (residential only)	Building (roof modification)	1 week	Building: Valuation excluding cost of PV equipment	None	-	-
Manhattan	Building, Electrical	Building (roof-mount), Electrical	1-2 days	Building: Valuation	Building (roof-mount), Electrical	1-2 days	Building: Valuation
Miles City	Building	Building	Same day	Building: Valuation	Building	1 week	Building: Valuation
Missoula	Building, Electrical	Building (roof modification or pole-mount), Electrical	2 days to 2-3 weeks (depending on whether zoning review is required)	Building: Valuation excluding cost of PV equipment (roof-mount); Valuation including cost of PV equipment (pole-mount); Electrical: $53	Building, Electrical	2-3 weeks	Building: Valuation; Electrical: Valuation including cost of PV equipment
Missoula County	Building, Electrical	Building, Electrical	Same day	Building: $45-90; Electrical: $62	Building, Electrical	Same day	Building: $45-90; Electrical: $62
Pinesdale	Electrical (residential only)	Electrical (possibly)	Unknown	Unknown	None	-	-
Pondera County	Building (commercial only)	None	-	-	Building	5 days	Building: Valuation including cost of PV equipment
Red Lodge	Building	Building	Same day	Building: Valuation including cost of PV equipment	Building	Same day	Building: Valuation including cost of PV equipment
Richland County	Building	None	-	-	Building	1-2 days	Building: Valuation
Ronan	Building	Building (roof modification)	Same day	Building: Valuation	Building (roof modification)	2-3 days	Building: Valuation

		Residential Solar PV Permitting			Commercial Solar PV Permitting		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**	**Permit(s) Required ****	**Typical Turnaround**	**Permit Fees†**
Shelby	Building	Building	Same day	Building: Valuation	Building	3-5 days	Building: Valuation
Sidney	Building	None	-	-	Building	1-2 days	Building: Valuation
Stevensville	Building, Electrical	Building, Electrical	Same day	Building: Valuation; Electrical: $75	Building, Electrical	Same day	Building, Electrical: Valuation
Toole County	Building (commercial only)	None	-	-	Building	5 days	Building: Valuation including cost of PV equipment
Townsend	Building	Information not available					
Troy	Building	Building (pole-mount)	5-7 days	Building: Valuation excluding cost of PV equipment	Building (pole-mount)	5-7 days	Building: Valuation excluding cost of PV equipment
West Yellowstone	Building (residential only)	Building (possibly)	2-3 days	Building: Valuation	None	-	-
Whitefish	Building, Electrical	Building (roof-mount), Electrical	3 days	Building: $75-100; Electrical: $120	Building (roof-mount), Electrical	3 days	Building: $75-100; Electrical: $120
Wolf Point	Building	Building (roof-mount)	1-4 weeks	Building: Valuation plus plan review fee ($350-500 total)	Building (roof-mount)	1-4 weeks	Building: Valuation plus plan review fee
State of Montana	Building, Electrical	Electrical	Same day	Electrical: $45	Building, Electrical	Same day	Building: Valuation including cost of PV equipment; Electrical: Valuation excluding cost of PV equipment

NOTES

* Some jurisdictions also issue plumbing, medical/gas, and/or mechanical permits. For a full list of the permits issued by each jurisdiction, see Appendix A.

**** Parentheticals indicate that the permit is required only under the specified conditions. For example, "Building (roof-mount)" means that a building permit is required only for roof-mounted PV systems, and not for ground/pole-mounted PV systems.

† Officials in some jurisdictions specified whether or not valuation-based permit fees take into account the value of the PV equipment (see discussion of this issue in the previous section). This information is included in the table where available.

Observations from Solar Installers

In addition to gathering information from permitting authorities throughout the state, the study authors spoke with six installers of renewable energy systems about their experiences obtaining permits for solar PV systems.

We spoke with Henry Dykema of Sundance Solar Systems (Red Lodge), Rip Hamilton of Solar Plexus (Missoula), Jackson Isbell of Solar Montana (Helena), Ben Reed of Winpower West (Billings), Orion Thornton of Onsite Energy (Butte and Bozeman), and Jeff Wongstrom of Thirsty Lake Solar (Bozeman and Eureka). These installers have experience dealing with a wide range of permitting jurisdictions, including Billings, Bozeman, Butte, Great Falls, Helena, Kalispell, Missoula, Red Lodge, and the State of Montana.

The information obtained from installers is summarized in the following three observations. Not all installers mentioned all three of these observations, but each observation was mentioned by multiple installers.

Observation 1: Existing permitting requirements are not clear or specific to solar PV

Installers pointed out that in many jurisdictions, building and electrical permitting requirements for solar PV projects are not clear. They mentioned that some permitting officials in small jurisdictions are unfamiliar with solar PV and unsure how to treat it for permitting purposes. Even in larger cities, solar PV permitting policies are rarely explicit. Because of this lack of clarity, as well as the fact that permitting requirements change over time, installers often feel the need to call and confirm the permitting requirements each time they install a system. According to installers, clear, explicit permitting policies for solar PV systems would make the permitting process more efficient.

Installers also pointed out the importance of ensuring that permitting requirements are appropriate for solar PV technologies. Currently, Bozeman is the only permitting jurisdiction in Montana that has solar-specific permitting requirements. The City of Bozeman sought input from local solar installers in the development of a "PV System Checklist" that must be submitted along with the building permit application. However, several years have passed since the checklist was developed, and installers noted that the form should be updated to accommodate new solar technologies such as micro-inverters.

Several installers pointed to the "Expedited Permit Process for PV Systems" developed by the Solar America Board for Codes and Standards (Brooks 2012) as a good model that could be used with input from local stakeholders to develop appropriate solar permitting processes in Montana jurisdictions.

Observation 2: Not all inspectors are knowledgeable about solar PV

Installers described their experiences with a range of building and electrical inspectors, some of them very knowledgeable about solar technologies and others less so. Installers pointed out that even solar-specific permitting requirements cannot ensure that solar systems are installed safely unless inspectors and plan reviewers are knowledgeable about solar technologies. Several installers suggested that solar

PV permitting processes could be improved if solar training were made available for building and electrical inspectors and plan reviewers throughout the state.

Observation 3: Some permit fees are not commensurate with solar PV permitting costs

Permit fees vary widely across the state, and there is significant confusion among installers as to how valuation-based fees should be calculated for solar PV projects. Installers suggested that permit fees for solar PV systems should be commensurate with the cost of the work required by inspectors and plan reviewers to permit the systems.

Several installers also pointed out that the engineering reviews required in some jurisdictions can be redundant when specifying pre-engineered components. For instance, roof-mounted systems should include a review of the existing roof and its ability to carry additional load; however pole- or ground-mounted systems using pre-engineered racks should not require additional engineering reviews.

Conclusion and Recommendations

In Montana, solar PV permitting processes vary widely by jurisdiction. While an electrical permit (issued either by the state or a local jurisdiction) is required for all residential solar PV systems in Montana, electrical permit fees range from $40 to more than $400, depending on the jurisdiction and project cost. Building permits are required in some jurisdictions but not others, with fees ranging from $45 to more than $400. A few jurisdictions also require zoning permits for residential solar PV systems. Turnaround times for issuing permits range from less than one day to as much as four weeks.

Bozeman is the only jurisdiction in Montana with a PV-specific component of its permitting process — a "PV System Checklist" that must be submitted with the building permit application.

The wide variety of solar PV permitting processes in Montana indicates that significant potential exists to streamline permitting processes, and, in some cases, to reduce permitting fees by ensuring that fees are commensurate with the costs of permitting solar PV systems. This potential is underscored by observations from solar installers interviewed as part of this study.

The authors and sponsors of this study conclude that existing resources, such as the "Expedited Permit Process for PV Systems" developed by the Solar America Board for Codes and Standards (Brooks, 2012), should be more closely examined for possible application in Montana. In addition, we recommend that training and educational opportunities be developed for local code officials to increase familiarity with solar technologies and solar-specific permitting considerations. Finally, we recommend that the state and local jurisdictions evaluate their permit fee structures to ensure that solar PV permitting fees reflect the costs associated with the permitting process.

References

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Barbose, G.; Darghouth, N.; Wiser, R. (2012). *Tracking the Sun V: An Historical Summary of the Installed Cost of Photovoltaics in the United States from 1998 to 2011*. Berkeley, CA: Lawrence Berkeley National Laboratory. http://emp.lbl.gov/sites/all/files/lbnl-5919e.pdf

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U.S Department of Energy (2012). *SunShot Vision Study*. http://www1.eere.energy.gov/solar/pdfs/47927.pdf

Code Officials Contacted By Jurisdiction

State of Montana
Rick Lee, Building Codes Bureau, personal communication 11/26/12 and 1/30/13

Anaconda-Deer Lodge County
Dustin McKenney, Building Inspector, personal communication 11/15/12
Doug Clark, Planning Director, personal communication 2/13/13

Belgrade
Jason Karp, Planner, personal communication 11/2/12

Billings
Kim Palmieri, Building Official, personal communication 11/2/12 and 4/29/13
Nicole Cromwell, Zoning Coordinator, personal communication 12/6/12

Bozeman
Tim Mcgough, Plans Examiner, personal communication 11/15/12 and 4/29/13
Tara Hastie, Planning Department, personal communication 12/7/12

Butte-Silver Bow County
John Harrington, Building Department Director, personal communication 1/15/13 and 5/1/13
Steve Hess, Senior Planner, personal communication 1/15/13

Choteau
Kyle Harlan, Contract Building Inspector, personal communication 1/16/13

Colstrip
Jan Morgan, Building, Zoning, and Code Enforcement Office, personal communication 11/15/12

Columbia Falls
Virgil Bench, Building Inspector, personal communication 11/20/12
Eric Mulcahey, City Contract Planner, personal communication 12/7/12

Conrad
Kyle Harlan, Contract Building Inspector, personal communication 1/16/13

Cut Bank
Jim Yeagley, Building Inspector, personal communication 12/10/12

Darby
Nate Robbins, Public Works Director, personal communication 11/16/12

East Helena
Craig Jenneskens, Building Inspector, personal communication 11/16/12
Jeremy Fadness, Zoning Administrator, personal communication 12/7/12

Forsyth
Dennis Hirsch, Building Official, personal communication 12/5/12

Fort Benton
Harry Buckingham, Building Official, personal communication 12/6/12

Glasgow
Robert Kompel, Director of Public Works, personal communication 2/8/13

Glendive
George Lane, Building Official, personal communication 11/16/12

Great Falls
Craig Raymond, Building Official, personal communication 11/29/12 and 4/30/13

Hamilton
Land Hanson, Building Inspector, personal communication 12/6/12

Hardin
Dallas Eidem, Building Inspector, personal communication 11/21/12

Havre
David Peterson, Public Works Director, personal communication 12/6/12

Helena
Brandt Salo, Chief Building Official, personal communication 1/15/13 and 5/3/13
Elroy Golemon, Zoning Officer, personal communication 1/15/13

Hysham
Bob Keele, Director of Public Works, personal communication 2/8/13

Kalispell
Jeff Clawson, Building Official, personal communication 11/21/12

Laurel
Gary Colley, Building Inspector, personal communication 2/5/13

Lewistown
Rick Benton, Building Inspector, personal communication 11/21/12

Libby
Ron Higgins, Building Inspector, personal communication 2/8/13

Livingston
Jim Woodhull, Director of Building, Planning and Code Enforcement, personal communication 1/15/13

Malta
John Demarais, Public Works Director, personal communication 12/6/12

Manhattan
Dave Rowell, Building Inspector, personal communication 11/20/12

Miles City
Dennis Hirsch, Building Inspector, personal communication 12/5/12

Missoula
Don Verrue, Building Official, personal communication 11/26/12, 2/12/13 and 5/1/13

Missoula County
Steve Hutchings, Chief Building Official, personal communication 12/10/12
Jamie Erbacher, Planner, personal communication 2/8/13

Pinesdale
Russell Jessop, Administrator, personal communication 1/18/13

Pondera County
Kyle Harlan, Contract Building Inspector, personal communication 1/16/13

Red Lodge
Tim Swansborough, Building Officer, personal communication 2/5/13
James Caniglia, Planner, personal communication 2/8/13

Richland County
Alton Hillesland, Building Inspector, personal communication 11/21/12

Ronan
Dan Miller, Public Works Director, personal communication 11/26/12

Shelby
Rob Tasker, Building Inspector, personal communication 12/5/12

Sidney
Alton Hillesland, Building Inspector, personal communication 11/21/12

Stevensville
Dennis Monroe, Building Inspector, personal communication 11/26/12

Toole County
Kyle Harlan, Contract Building Inspector, personal communication 1/16/13

Troy
Ron Higgins, Building Inspector, personal communication 2/8/13

West Yellowstone
James Patterson, Public Services Superintendent, personal communication 11/26/12

Whitefish
Virgil Bench, Building Inspector, personal communication 11/20/12

Wolf Point
Brian Milne, Principal Engineer, Interstate Engineering, personal communication 12/6/12
Rick Isle, Public Works Director, personal communication 1/16/13 and 4/29/13

Solar Installers Contacted

Henry Dykema, Sundance Solar Systems, Red Lodge, personal communication 1/21/13

Rip Hamilton, Solar Plexus, Missoula, personal communication 1/24/13

Jackson Isbell, Solar Montana, Helena, personal communication 1/25/13

Ben Reed, Winpower West, Billings, personal communication 1/25/13

Orion Thornton, Onsite Energy, Butte/Bozeman, personal communication 1/25/13

Jeff Wongstrom, Thirsty Lake Solar, Bozeman/Eureka, personal communication 1/21/13

Appendix A. Certified Cities List

MONTANA CERTIFIED LOCAL GOVERNMENT PROGRAM (from MT Building Codes Bureau, updated 8/8/2012)				
CITY	**CODES**	**BUILDING OFFICIAL**	**PHONE**	**JURISDICTION**
Anaconda-Deer Lodge	B	Dustin McKenney	563-4011	County
Belgrade	B, P	Jason Karp	388-4994	City
Billings	B, P (M/G), E, M	Kim Palmieri	657-8273	City
Bozeman	B, P, E	Tim Mcgough	582-2372	City
Butte-Silver Bow	B, P, E, M	John Harrington	497-6210	County
Choteau	B	Kyle Harlan	466-2510	City
Colstrip	B (Res. Only)	Jan Morgan	748-2300	City
Columbia Falls	B, P (M/G), E, M	Virgil Bench	863-2410	City
Conrad	B	Kyle Harlan	271-3623	City
Cut Bank	B	Jim Yeagley	434-5222	City
Darby	B	Nate Robbins	821-4510	City
East Helena	B, E	Craig Jenneskins	447-5000	City
Forsyth	B	Dennis Hirsch	346-2521	City
Fort Benton	B	Harry Buckingham	622-5494	City
Glasgow	B, M	Robert Kompel	228-2476	City
Glendive	B	George Lane	377-2361	City
Great Falls	B, P (M/G), E, M	Craig Raymond	455-8530	City
Hamilton	B, P	Land Hanson	363-3316	City
Hardin	B	Dallas Eidem	665-9264	City
Havre	B	David Peterson	265-4941	City
Helena	B, P, E, M	Brandt Salo	447-8439	City
Hysham	B	M. Lyle Maasch	342-5544	City
Kalispell	B, P (M/G), M	Jeff Clawson	758-7734	City
Laurel	B	Gary Colley	628-4796	City
Lewistown	B (comm)	Rick Benton	535-1776	City
Libby	B	Ron Higgins	293-2731	City
Livingston	B	Jim Woodhull	222-0083	City
Malta	B (res)	John Demarais	654-1676	City
Manhattan	B, P (M/G), E, M	Dave Rowell	284-3235	City
Miles City	B	Dennis Hirsch	234-3493	City
Missoula	B, P (M/G), E, M	Don Verrue	552-6042	City
Missoula County	B, P, E, M	Steve Hutchings	258-3776	County
Pinesdale	E (res)	Russell Jessop	961-1271	City
Pondera County	B (comm)	Kyle Harlan	721-3623	County
Red Lodge	B	Tim Swansborough	446-0196	City
Richland County	B	Alton Hillesland	480-2289	County except Fairview, Sidney
Ronan	B	Dan Miller	676-4231	City
Shelby	B	Rob Tasker	434-5564	City
Sidney	B	Alton Hillesland	480-2289	City
Stevensville	B, P, E, M	Dennis Monroe	777-5271	City
Toole County	B (comm)	Kyle Harlan	424-8310	County
Townsend	B, M	Jim Schauber	266-3911	City
Troy	B	Ron Higgins	291-0177	City
West Yellowstone	B (res)	James Patterson	646-7609	City
Whitefish	B, P (M/G), E, M	Virgil Bench	863-2410	City
Wolf Point	B	Brian Milne	433-5617	City
KEY: B= Building, P = Plumbing, M/G = Medical Gas, E = Electrical, M = Mechanical				

Appendix B. Information Requested from Permitting Jurisdictions

1) What are the permitting requirements for solar electric (photovoltaic) systems?
    a. Building permit/inspection?
    b. Electrical permit/inspection?
    c. Other permit/inspection?
    d. Process to obtain permits?
    e. Fees: flat or based on the value of the system? What are they?
    f. What is the typical turnaround time to get a system permitted?
    g. Any differences between residential and commercial solar systems?

2) For small wind systems:
    a. Building permit/inspection?
    b. Electrical permit/inspection?
    c. Other permit/inspection (e.g. variance, conditional use permit)? Tower height limit?
    d. Process to obtain permits?
    e. Fees: flat or based on the value of the system? What are they?
    f. What is the typical turnaround time to get a system permitted?
    g. Any differences between residential and commercial wind systems?

3) For micro-hydropower systems:
    a. Building permit/inspection?
    b. Electrical permit/inspection?
    c. Other permit/inspection?
    d. Process to obtain permits?
    e. Fees: flat or based on the value of the system? What are they?
    f. What is the typical turnaround time to get a system permitted?
    g. Any differences between residential and commercial micro-hydro systems?

4) How are the permitting staff and inspectors funded? Through permit fees, general fund, another mechanism?

5) Any other comments?

Appendix C. Information Requested from Solar Installers

1) Which jurisdictions (cities/counties/state) have you dealt with regarding the permitting of solar PV, wind, and/or micro-hydro systems in Montana?

2) Of those jurisdictions, which has been easiest to work with? Why?

3) Which has been the most difficult to work with? Why?

4) In your view, how could permitting jurisdictions improve their processes for the permitting of renewable energy systems?

5) What guidance have you received from permitting jurisdictions about calculating valuation-based permit fees for renewable energy projects? How do you typically calculate valuation-based permit fees?

Appendix D. Small Wind Turbine Permitting Requirements

The following sections summarize state and local building, electrical, and zoning permit requirements for small wind turbines in Montana. Table 3 compares wind ordinances in three Montana cities, and Table 4 displays the permit(s) required, turnaround times, and method for determining permit fees in each permitting jurisdiction.

State of Montana Requirements – Building and Electrical Permits

The State of Montana does not issue building permits for residential buildings of less than five units. Therefore, residential wind turbines in the state's jurisdiction require only an electrical permit. State electrical permits for residential projects can be obtained online by filling out a simple form and paying $45. Either the homeowner or an electrical contractor can obtain the permit. The process is completed with a site visit by the state electrical inspector who covers that region of the state.

Commercial wind projects in the state's jurisdiction require both a building permit and an electrical permit. A permit application and plans should be submitted to the State Building Codes Bureau in Helena. Unlike for solar PV projects, in which the building permit can be issued onsite by a state building inspector, building permits for wind systems must be reviewed by an engineer, and thus must be submitted to the office in Helena. The turnaround time is 2-3 weeks.

Commercial building permit fees are valuation-based; for example, for a $20,000 project, the fee would be $321.25. The permit fee is calculated based on the entire cost of the project, including the cost of the wind turbine equipment.

State electrical permits for commercial projects can be obtained online by an electrical contractor. Alternatively, the electrical permit can be obtained in the field by calling the state electrical inspector to the site. Electrical permit fees are valuation-based and should be calculated based on the cost of the electrical work (i.e., the connection to the electric grid), not the entire project cost.

Local Government Requirements – Building and Electrical Permits

Most wind turbines are installed in rural areas, and thus are not within in the jurisdiction of any city or town. Just six of Montana's 56 counties are certified to issue building or electrical permits. The vast majority of small wind turbines in Montana are therefore subject only to state permitting authority. Nevertheless, we collected information about permitting requirements that would apply to wind turbines in all permitting jurisdictions in the state.

Permit Required

Of the 41 local governments that issue residential building permits from which we gathered information, 32 require building permits for residential wind turbines. Three others require building permits for residential wind turbines under certain conditions; for example, in Hamilton, a building permit is required only if the turbine is not pre-manufactured and engineered. Six do not require building permits for residential wind turbines.

Similarly, of the 41 local governments that issue commercial building permits from which we gathered information, 34 require building permits for all commercial wind turbines; two require building permits for commercial wind turbines under certain conditions; and five do not require building permits for commercial wind turbines.

Thirteen local governments issue residential electrical permits, and twelve issue commercial electrical permits. All of these require electrical permits for wind turbines.

Permitting Process

With the exception of planning/zoning requirements (see next section), the steps involved in permitting small wind turbines are similar to the steps involved in permitting solar PV systems. In all cases, the homeowner is required to submit an application and plans, pay a fee, and undergo one or more inspections. Most jurisdictions require that building plans be stamped by a licensed architect or engineer for commercial projects, whereas this is typically not required for residential projects.

Turnaround Times

Not including zoning permission, average turnaround times for wind turbine permitting (building and electrical) are 5-7 days for residential projects and 7-9 days for commercial projects.

However, turnaround times for both residential and commercial projects are quite variable, ranging from less than one day to as much as four weeks.

In those jurisdictions that require additional zoning permission for wind turbines (see next section), turnaround times of 1-2 months are typical.

Permit Fees

Building and electrical permit fees are treated the same for wind turbines as for solar PV projects, and the discussion of permit fees in the solar PV section applies equally to wind turbines.

In many jurisdictions, wind turbines are also assessed fees associated with zoning permission (such as variance or conditional use processes – see next section). These fees vary enormously, from $15 to more than $1,000, with a median of around $100.

Local Government Requirements – Zoning Permits and Height Restrictions

In much of rural Montana, there are no height restrictions on wind turbines, and no zoning rules apply. Many cities and towns, by contrast, require that wind turbines follow zoning ordinances and/or apply for a variance or conditional use permit.

Three Montana cities have ordinances in place specifically addressing small wind turbines: Great Falls, Livingston, and Missoula. These three wind ordinances are compared in Table 3.

Table 3. Comparison of Great Falls, Livingston, and Missoula Wind Ordinances

	Great Falls	Livingston	Missoula
Date Adopted	July 2009	August 2008	October 2010
Max Turbine Power	10 kW residential, 100 kW non-residential	Not specified	25 kW
Max Turbine Height	80 ft residential, 125 ft non-residential	60 ft on lot of ≤ 1 acre; 100 ft on lot of > 1 acre; 15 ft for building-mounted turbines; or taller if approved by Board of Adjustment	Height limit of zoning district (typically 30-35 ft)
Setback	1.1 times turbine height for turbines ≤ 80 ft; 2 times turbine height for turbines > 80 ft	Equal to turbine height; no guy wire within 30 ft of property line	1.1 times turbine height
Noise Limit	Existing city noise standards	60 dB from closest occupied building	55 dB at property line except during storms
Design	Matte finish, neutral color, no commercial messages	Neutral color, no commercial messages	Matte finish, neutral color, no commercial messages, no lattice towers or guy wires
Lighting	Unlit unless required by FAA	Unlit unless required by FAA or other agency	Unlit unless required by federal or state agency

Most jurisdictions do not specifically address wind turbines in their zoning codes, but require variances or conditional use permits for wind turbines. In most cases, zoning permits are required only for turbines that exceed a certain height limit. That height "trigger" is typically the zoning height limit for buildings, usually 30-35 feet. The vast majority of conventional, horizontal-axis wind turbines will exceed these height triggers.

Both variances and conditional use permits involve granting an exception from zoning rules for a particular project. All variance and conditional use processes involve public hearings at which neighboring property owners and other interested residents are invited to participate. Many cities have a Board of Adjustment that hears variance/conditional use permit cases. In some cities the Board of Adjustment's decision is final, and in others the Board of Adjustment makes a recommendation to the city council, which has ultimate authority.

Variance/conditional use processes typically take at least 1-2 months, and involve fees ranging from $15 to more than $1,000, depending on the jurisdiction.

In many jurisdictions, wind turbines must also meet airport height restrictions.

Table 4 displays permitting requirements, turnaround times, and permit fees for both residential and commercial wind turbines by jurisdiction.

Table 4. Small Wind Turbine Permitting Requirements

		Residential Wind Turbines			Commercial Wind Turbines		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****
Anaconda-Deer Lodge County	Building	Administrative Development Permit, plus variance if >35 ft (in town only)	40 days (variance)	Administrative Development Permit: $25; Variance: ~$100	Administrative Development Permit, plus variance if >35 ft (in town only)	40 days (variance)	Administrative Development Permit: $25; Variance: ~$100
Belgrade	Building	Building, Height limit 150 ft (airport)	1-2 weeks	Building: Valuation	Building, Height limit 150 ft (airport)	1-2 weeks	Building: Valuation
Billings	Building, Electrical	Not permitted by zoning (no variance possible)	-	-	Building, Electrical, Conditional Use Permit	2 months (CUP)	Building, Electrical: Valuation; CUP: $1,071
Bozeman	Building, Electrical	Building, Electrical, Zoning permit if in overlay district, Variance if >44 ft	2-3 months (variance)	Building, Electrical: Valuation; Zoning: $100; Variance: $875-1,625	Building, Electrical, Zoning permit if in overlay district, Variance if >66 ft (commercial) or 67.5 ft (industrial)	2-3 months (variance)	Building, Electrical: Valuation; Zoning: $100; Variance: $875-1,625
Butte-Silver Bow County	Building, Electrical	Building, Electrical, Variance if >39.5 ft in City of Butte	3 weeks (variance)	Building: Valuation incl. cost of wind equipment; Electrical: Valuation excluding cost of wind equipment; Variance: $35	Building, Electrical, Variance if >39.5 ft in City of Butte	3 weeks (variance)	Building: Valuation incl. cost of wind equipment; Electrical: Valuation excluding cost of wind equipment; Variance: $50
Choteau	Building	Building, Board of Adjustment Review	5 days not including Board of Adjustment	Building: Valuation, including cost of wind equipment	Building, Board of Adjustment Review	5 days not including Board of Adjustment	Building: Valuation, including cost of wind equipment
Colstrip	Building (residential only)	Building, Zoning permit, Conditional Use Permit	1 month (CUP)	Building: Based on square footage; Zoning: $15; CUP: $25	Zoning permit, Conditional Use Permit	1 month (CUP)	Zoning: $15; CUP: $25
Columbia Falls	Building, Electrical	Building, Electrical, Variance if >35 ft	1 month (variance)	Building: $75-100; Electrical: $125; Variance: $250	Building, Electrical, Variance if >35 ft	1 month (variance)	Building: $75-100; Electrical: $125; Variance: $250

		Residential Wind Turbines			Commercial Wind Turbines		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****
Conrad	Building	Building	5 days	Building: Valuation, including cost of wind equipment	Building	5 days	Building: Valuation, including cost of wind equipment
Cut Bank	Building	Zoning permit, Variance if >35 ft	1 month (variance)	Zoning: $20; Variance: no fee	Zoning permit, Variance if >35 ft	1 month (variance)	Zoning: $20; Variance: no fee
Darby	Building	Building, Variance if >24 ft	6 weeks (variance)	Building: Valuation; Variance: approx. $100	Building, Variance if >24 ft	6 weeks (variance)	Building: Valuation: Variance: approx. $100
East Helena	Building, Electrical	Building, Electrical, Variance if >30 ft	1 month (variance)	Building, Electrical: Valuation; Variance: $700	Building, Electrical, Variance if >30 ft (commercial) or 45 ft (industrial)	1 month (variance)	Building, Electrical, Valuation; Variance: $700
Forsyth	Building	Building, Variance or Conditional Use Permit	1 month (variance/ CUP)	Building: Valuation; Variance/CUP: $75	Building	1 month (variance/ CUP)	Building: Valuation; Variance/CUP: $75
Fort Benton	Building	Building, Variance if >35 ft	3 weeks (variance)	Building: Based on square footage; Variance: no fee	Building, Variance if >35 ft (commercial) or 45 ft (industrial)	3 weeks (variance)	Building: Based on square footage; Variance: no fee
Glasgow	Building	Building, Variance if exceeds zoning height limit (varies)	4-6 weeks (variance)	Building: Valuation excluding cost of wind equipment; Variance: $200	Building (no height limit in commercial zone, so variance not required)	2 weeks	Building: Valuation excluding cost of wind equipment
Glendive	Building	Building	2 weeks	Building: Valuation	Building	2 weeks	Building: Valuation
Great Falls	Building, Electrical	Building, Electrical, Compliance with Wind Ordinance, Height limit 80 ft	3-5 days	Building: Valuation, excluding cost of wind equipment; Electrical: Valuation, incl. cost of wind equipment	Building, Electrical, Compliance with Wind Ordinance, Height limit 125 ft	2-4 weeks	Building: Valuation, excluding cost of wind equipment; Electrical: Valuation, incl. cost of wind equipment
Hamilton	Building	Building (if not pre-engineered), not permitted if >18 ft (no variance possible)	-	-	Building (if not pre-engineered), not permitted if >18 ft (no variance possible)	-	-

		Residential Wind Turbines			Commercial Wind Turbines		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****
Hardin	Building	Building, Conditional Use Permit if >25 ft	2-3 months (CUP)	Building: Valuation; CUP: $25-150	Building, Conditional Use Permit if >25 ft	2-3 months (CUP)	Building: Valuation; CUP: $25-150
Havre	Building	Building, Variance or Conditional Use Permit	45 days (variance/ CUP)	Building: Valuation; Variance/CUP: unknown	Building, Variance or Conditional Use Permit	45 days (variance/ CUP)	Building: Valuation; Variance/CUP: unknown
Helena	Building, Electrical	Building, Electrical, Variance if >24 ft	2-3 months (variance)	Building: Valuation, excluding cost of wind equipment; Electrical: $56; Variance: $125	Building, Electrical, Variance if >36-70 ft (depending on zone), plus airport restrictions	2-3 months (variance)	Building: Valuation, excluding cost of wind equipment; Electrical: Valuation incl. cost of wind equipment; Variance: $125
Hysham	Building	City Council approval	Up to 1 month	None	City Council approval	Up to 1 month	None
Kalispell	Building	Building, Conditional Use Permit if >35 ft	2-3 months (CUP)	Building: Valuation; CUP: $250	Building, Variance if >35 ft	2-3 months (CUP)	Building: Valuation; CUP: $400
Laurel	Building	Variance if >30-35 ft	Unknown	Unknown	Variance if >30-35 ft	Unknown	Unknown
Lewistown	Building (commercial only)	Variance if >35 ft	3-4 weeks (variance)	Variance: $100-150	Building, Variance if >25 ft	3-4 weeks (variance)	Building: Valuation; Variance: $100-150
Libby	Building	Building, Variance if >35 ft	30-45 days (variance)	Building: Valuation excluding cost of wind equipment; Variance: $15	Building, Variance if >45 ft	30-45 days (variance)	Building: Valuation excluding cost of wind equipment; Variance: $15
Livingston	Building	Building, Compliance with Wind Ordinance, Height limit 60 ft (<1 acre) or 100 ft (>1 acre)	Unknown	Building: Valuation; Zoning (Wind Ordinance): $100	Building, Compliance with Wind Ordinance, Height limit 60 ft (<1 acre) or 100 ft (>1 acre)	Unknown	Building: Valuation; Zoning (Wind Ordinance): $100
Malta	Building (residential only)	Building (possibly), not permitted if >50-55 ft due to airport	1 week	Building: Valuation	Not Permitted if >50-55 ft due to airport	-	-
Manhattan	Building, Electrical	Building, Electrical, Conditional Use Permit	2 months (CUP)	Building, Electrical: Valuation; CUP: unknown	Building, Electrical, Conditional Use Permit	2 months (CUP)	Building, Electrical: Valuation; CUP: unknown

		Residential Wind Turbines			Commercial Wind Turbines		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****
Miles City	Building	Building, Variance or Conditional Use Permit	1 month (variance/CUP)	Building: Valuation; Variance/CUP: $75	Building	1 month (variance/CUP)	Building: Valuation; Variance/CUP: $75
Missoula	Building, Electrical	Building, Electrical, Compliance with Wind Ordinance, Height limit 30-35 ft or Conditional Use Permit	2-3 weeks	Building: Valuation excluding cost of wind equipment; Electrical: $53	Building, Electrical, Compliance with Wind Ordinance, Height limit 30-35 ft or Conditional Use Permit	2-3 weeks	Building: Valuation excluding cost of wind equipment, Electrical: Valuation including cost of wind equipment
Missoula County	Building, Electrical	Building, Electrical, Special Exception, Variance if >30 ft, Zoning Permit	45 days (special exception/ variance/ zoning)	Building: $45-90; Electrical: $62; Special Exception: $1,185; Variance: $825; Zoning: $100	Building, Electrical, Special Exception, Variance if >45 ft, Zoning Permit	45 days (special exception/ variance/ zoning)	Building: $45-90; Electrical: $62; Special Exception: $1,185; Variance: $1,095; Zoning: $200
Pinesdale	Electrical (residential only)	Electrical (possibly)	Unknown	Unknown	None	-	-
Pondera County	Building (commercial only)	None	-	-	Building	5 days	Building: Valuation, including cost of wind equipment
Red Lodge	Building	Building, Height limit 30-40 ft (no variance)	Same day	Unknown	Building, possibly variance	Unknown	Unknown
Richland County	Building	Building, Height limit 75-100 ft (airport)	1-2 days	Building: Valuation	Building, Height limit 75-100 ft (airport)	1-2 days	Building: Valuation
Ronan	Building	Possibly Variance	Unknown	Variance: $100	Variance if >70 ft	Unknown	Variance: $100
Shelby	Building	Building, Conditional Use Permit if >30 ft	2 weeks (CUP)	Building: Valuation; CUP: $24	Building, Conditional Use Permit if >30 ft	2 weeks (CUP)	Building: Valuation; CUP: $24
Sidney	Building	Building, Height limit 75-100 ft (airport)	1-2 days	Building: Valuation	Building, Height limit 75-100 ft (airport)	1-2 days	Building: Valuation
Stevens-ville	Building, Electrical	Building, Electrical, Height limit 45-55 ft	Same day	Building: Valuation; Electrical: $75	Building, Electrical, Height limit 45-55 ft	Same day	Building, Electrical: Valuation

		Residential Wind Turbines			Commercial Wind Turbines		
Permitting Authority	**Permit(s) Issued (Building/Electrical)***	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****	**Permit(s) Required**	**Turnaround Time**	**Permit Fees****
Toole County	Building (commercial only)	None	-	-	Building	5 days	Building: Valuation, including cost of wind equipment
Townsend	Building	Information not available					
Troy	Building	Building, Variance if >35 ft	30-45 days (variance)	Building: Valuation excluding cost of wind equipment; Variance: $15	Building, Variance if >45 ft	30-45 days (variance)	Building: Valuation excluding cost of wind equipment; Variance: $15
West Yellow-stone	Building (residential only)	Conditional Use Permit	1-3 weeks (CUP)	CUP: unknown	Conditional Use Permit	1-3 weeks (CUP)	CUP: unknown
Whitefish	Building, Electrical	Building, Electrical, Variance if >35 ft	Unknown	Building: $75-100; Electrical: $120; Variance: $660	Building, Electrical, Variance if >35 ft	Unknown	Building: $75-100; Electrical: $120; Variance: $1,980
Wolf Point	Building	Building if >50 ft	1-4 weeks	Building: Valuation plus plan review fee	Building if >50 ft	1-4 weeks	Building: Valuation plus plan review fee
State of Montana	Building, Electrical	Electrical	Same day	Electrical: $45	Building, Electrical	2-3 weeks	Building: Valuation including cost of wind equipment; Electrical: Valuation excluding cost of wind equipment

NOTES

* Some jurisdictions also issue plumbing, medical/gas, and/or mechanical permits. For a full list of the permits issued by each jurisdiction, see Appendix A.

** Officials in some jurisdictions specified whether valuation-based permit fees take into account the value of the wind equipment (see discussion of this issue in the solar PV section). This information is included in the table where available.

Appendix E. Notes on Micro-Hydro Permitting

None of the local governments we spoke with had experience permitting micro-hydro projects. Many noted that there is no running water within the limits of their town or city, making micro-hydro infeasible. Several others pointed out that micro-hydro projects were very unlikely to move forward due to issues unrelated to local permitting processes, such as water rights.

Issues surrounding water rights, environmental permits, and other state and federal permits for micro-hydro projects are beyond the scope of this report. We simply asked local governments how micro-hydro projects would be treated by their jurisdiction, assuming that water rights and all state and federal permits were in place. The majority of local governments were unsure how they would deal with micro-hydro. Most stated that if the project involved a building larger than a certain size (in most cases, 120 square feet), a building permit would be required. Those jurisdictions that issue electrical permits would also require an electrical permit for micro-hydro projects. Building and electrical permit processes, turnaround times, and fees would be the same as for solar PV and wind projects as described elsewhere in this report.