SOLAR Simplified
An Action Plan to Cut Costs and Red Tape in Summit County
This Action Plan is dedicated to Bill Vanderlin of Summit County, whose extensive knowledge, insights, and support were critical to the development and implementation of solar best practices in Summit County.

Acknowledgment: This material is based on work supported by the U.S. Department of Energy’s Energy Efficiency and Renewable Energy Solar Program SunShot Initiative and Rooftop Solar Challenge under Award Number DE-EE0005689.

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For more information, please visit:
www.eere.energy.gov/solarchallenge

A project of the Wasatch Solar Challenge with support from the U.S. Department of Energy SunShot Initiative Rooftop Solar Challenge

May 2013
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# Acknowledgments

The authors would like thank and acknowledge the contributions of the following organizations and individuals for their involvement in and support of the Wasatch Solar Challenge mission to streamline solar and reduce soft costs:

- **Wasatch Solar Challenge Partners**
  - Salt Lake City: Mayor Ralph Becker, Vicki Bennett, Lisa Shaffer, Orion Geoff, Sherron Collins
  - Salt Lake County: Mayor Peter Corroon, Mayor Ben McAdams, Kimi Barnett, Brent Unrau, Rachel Broadbent
  - Summit County: Summit County Council Members (Chris Robinson, Sally Elliot, Claudia McNamara, Dave Utz, Roger Armstrong, Kim Carson), Anita Lewis, Robert Taylor, Ashley Aheer, Stephanie Dalmatt-Connell, Bill Vanderlin
  - Park City: Mayor Dana Williams, Tyler Paulson, Roderick Evans, Chad Rea
  - Midvale: Mayor Joan Seegers, Christopher Butte, Donna Jackson
  - West Valley City: Mayor Mike Winder, Paul Isaac, Wayne Pyle, DeAnn Varney, Jason Nau
  - Utah Solar Energy Association: Elias Bishop
  - Utah Clean Energy: Sarah Wright, Rebecca Nelson, Brandy Smith, Sophie Hayes, Bonnie Christiansen, and Utah Conservation Corps Members, Kate Bowman & Ark Parker
  - Utah Solar Industry Representatives: Brad Stevens, Green Power Solutions; Bill Wilson, Dwell Tec; Brak Thaw, Hunt Electric; Chad Hathorne, Synergy Power Inc.; Charlie Bros, Creative Energies; Joe Raycroft, Utah Solar and Alternative Energy; Ken Gardner and Kyle Hartman, Gardner Engineering; Marc and Cammy Staker, Sunlight Solar Systems; Mark Richards, Intermountain Wind & Solar; Rob Adams and Ryan Lambert, 5-Power; Thaniel Bishop, Salt Lake Community College.

The authors would also like to thank the following individuals for their contributions to and review of this document:

- Kate Bowman, Utah Clean Energy and Utah Conservation Corps
- Sophie Hayes, Utah Clean Energy
- Ark Parker, Utah Clean Energy and Utah Conservation Corps
About the Wasatch Solar Challenge & the DOE SunShot Initiative

The Wasatch Solar Challenge is a diverse partnership of local governments and local non-profit organizations working collaboratively to create a widespread, “solar-friendly” environment that enables increased adoption of residential and commercial solar PV. Through workshops, trainings, and peer-to-peer exchange forums, partners collaborated to identify workable best practices for solar permitting, inspections, interconnection, zoning, and financing. Workshop findings and partner feedback helped inform the development of Customized Action Plans for simplified solar permitting for each jurisdiction. The Action Plans provide near-term, mid-term, and long-term recommendations to guide ongoing efforts to streamline and simplify solar, with the goal of creating more standardized solar processes across all jurisdictions (and, ultimately, across the State and throughout the West).

The Wasatch Solar Challenge partners, led by Project Manager Utah Clean Energy, also spearheaded innovative financing mechanisms and new programs designed to grow the local solar market. For example, the highly successful Salt Lake Community Solar Program (2012) leveraged group buying power to negotiate a 40 percent discount for rooftop solar and installed over 230 kilowatts of residential solar across Salt Lake County. This successful initiative received Utah Business Magazine’s 2012 Sustainable Business Award for Social Impact and was a finalist for the 2013 Governor's Excellence in Energy award. A similar bulk-purchase program launched in Summit County/Park City in Spring 2013. Learn more at www.mycommunitysolar.org.

The Wasatch Solar Challenge Team is one of 22 teams participating in the U.S. Department of Energy’s Rooftop Solar Challenge. The Challenge is working to spur solar power deployment by cutting red tape — streamlining and standardizing permitting, zoning, metering, and connection processes — and improving finance options to reduce barriers and lower costs for residential and small commercial rooftop solar systems. This Challenge is part of the Department’s larger SunShot Initiative to make solar energy more accessible and affordable, increase domestic solar deployment, and spur solar power deployment by cutting red tape — streamlining and standardizing processes across all jurisdictions.

The Wasatch Solar Challenge partners, led by Project Manager Utah Clean Energy, also spearheaded innovative financing mechanisms and new programs designed to grow the local solar market. For example, the highly successful Salt Lake Community Solar Program (2012) leveraged group buying power to negotiate a 40 percent discount for rooftop solar and installed over 230 kilowatts of residential solar across Salt Lake County. This successful initiative received Utah Business Magazine’s 2012 Sustainable Business Award for Social Impact and was a finalist for the 2013 Governor’s Excellence in Energy award. A similar bulk-purchase program launched in Summit County/Park City in Spring 2013. Learn more at www.mycommunitysolar.org.

Key Terms & Acronyms

- **Azimuth**: The orientation (south, southwest, west) of a solar PV system.
- **DOE**: The United States Department of Energy, a cabinet level federal agency.
- **Electricity Generation (or Output)**: The amount of electric energy produced by transforming other forms of energy, commonly expressed in kilowatt-hours (kWh) or megawatt-hours (MWh).
- **Grid-tied Solar**: A solar PV system that is interconnected with the utility grid via net-metering and interconnection agreements with the utility.
- **International Residential Code (IRC)**: Part of the International Building Code (IBC), the IRC sets building standards for residential structures.
- **Kilowatt (kW)**: Equal to 1000 Watts.
- **Kilowatt-hour (kWh)**: A unit of energy equivalent to one kilowatt (1 kW) of power expended for 1 hour of time. Mounting: The manner in which a solar PV system is affixed to the roof or ground (i.e. roof mount, ground mount, pole mount).
- **Megawatt (MW)**: Equivalent to 1000 Kilowatts; a measure of the use of electrical power.
- **Megawatt-hour (MWh)**: A unit of energy equivalent to one Megawatt (1 MW) of power expended for 1 hour of time.
- **National Electric Code (NEC)**: Sets standards and best practices for wiring and electrical systems.
- **Off-grid Solar**: A solar PV system that is not connected to the utility grid that often requires a battery back-up system (or other back-up generation system) to store electricity for later use.
- **Power**: The rate at which work is performed (the rate of producing, transferring, or using energy). Power is measured in Watts (W), kilowatts (kW), Megawatts (MW), etc.
- **Solar ABCs**: The Solar America Board for Codes and Standards is a collaborative effort funded by the DOE that dedicates experts to transforming solar markets by improving building codes, utility interconnection procedures, and product standards, reliability, and safety, and is part of DOE’s overall strategy to reduce barriers to the adoption of solar technologies and to stimulate market growth.
- **Solar Photovoltaic (Solar PV)**: Solar systems consisting of photovoltaic cells, made with semiconducting materials, that produce electricity when they are exposed to sunlight.
- **Solar PV System**: A typical PV system consists of PV panels (or modules) that combine to form an array; other system components may include mounting racks and hardware, wiring for electrical connections, power conditioning equipment, such as an inverter, batteries for electricity storage (optional). PV systems can provide electricity for an array of uses, including small, off-grid solar, remote cabins, boats, or RVs; off-grid (with battery back-up) or grid-connected homes, businesses, industrial facilities and farms; and/or large-scale, centrally located solar systems for utility or shared community electricity projects.
- **Thin Film Solar PV**: Solar PV technology used to generate electricity, made by depositing one or more thin layers of photovoltaic material on a substrate. Thin film solar is found in handheld calculators and in very large modules used in building-integrated installations and vehicle charging systems.

**Watts (W)**: A measure of the use of electrical power, as defined by the following equation: power (Watts) = voltage (volts) x current (amps).
The sun rises every day, shining down on more than 200 billion square feet of rooftops across the United States. Tapping into just a fraction of that potential presents an incredible opportunity for communities to meet more of their energy demand from inexhaustible, clean, homegrown solar energy. Standing in the way of that potential are two words that make solar more complex and costly than necessary: Red Tape. Across the country, solar customers and installers face an incomprehensible patchwork of permitting, zoning, and interconnection rules from more than 18,000 cities and 3,000 utilities. Despite the rigorous national standards for safety and code compliance for solar, there is no standardized national approach to local solar processes. Every town, county, state, and utility service territory has a different set of ordinances, procedures, and regulations. The resulting unpredictability and market instability stemming from this inconsistency ultimately leads to higher costs. In fact, recent studies have shown that local rules and procedures can have an enormous impact on the out-of-pocket price paid by the solar consumer—adding upwards of $500 per installed kilowatt of solar (or $2,500 for an average 5-kilowatt residential solar installation).

Over the past four years, the total cost of an installed solar energy system has decreased by thousands of dollars, making solar an increasingly attractive investment for homeowners and businesses. These price declines, however, are largely attributable to falling solar PV module (or panel) prices, which fell by $2 per watt from 2008 to 2011 and continued to decline through 2012. The hardware costs, or “hard” costs, of solar PV include the panels as well as mounting equipment, inverters, conduit, and wires. While continual improvements and breakthroughs are helping to reduce the hard costs of solar PV, the single biggest challenge to reducing solar prices in the U.S. is the non-hardware costs — or “soft costs.” The “soft costs” of solar are associated with permitting, application approval time, fees, inspections, utility interconnection procedures, zoning variance requests, customer acquisition costs, and other administrative costs, and currently make up at least 30-40% of the total installed cost of rooftop solar PV.

As homeowners and businesses weigh the economics of solar, cost and complexity often discourage investment. With limited solar adopters and inadequate economies of scale, market growth suffers, competition languishes, and the cycle of higher-than-necessary solar costs continues. On the other hand, as solar becomes cheaper and easier, more individuals and businesses will be primed to invest in an energy resource that simultaneously improves air and water quality, mitigates risks and costs associated with disruptive climate change, and preserves precious resources for future generations.

Fortunately, the solar game is changing with a national effort to cut through red tape and standardize solar processes. Numerous leading local governments, like Summit County, are turning their attention to the impact of local rules and regulations on the soft costs of solar. As part of the U.S. Department of Energy’s SunShot Initiative and National Rooftop Solar Challenge, local governments and organizations are collaborating nationally and regionally to share best practices, streamline the solar process, and reduce costs to citizens and businesses. Utah’s Wasatch Solar Challenge is one of twenty-two DOE Rooftop Solar Challenge Teams; partners include Salt Lake City, Salt Lake County, Midvale, Park City, Summit County, West Valley City, the Utah Solar Energy Association, and Utah Clean Energy (Team Project Manager). Through peer-to-peer forums, workshops, and regular information sharing, the team has been

Figure ES-1: A comparison between the price of solar in the United States and Germany.

working to streamline local solar process and tackle primary barriers to solar adoption, including expediting the solar permitting process, making zoning more solar friendly, increasing financing options for solar, and preserving or improving strong net metering and interconnection policies.

Each jurisdiction received a score comparing their local permitting and zoning processes to DOE Rooftop Challenge Solar Permitting Best Practices. Each score indicates how close (or far) a jurisdiction is from achieving national best practices in each category; it is assumed that adopting best practices will translate to lower costs, simpler processes, and standardized protocols. The goal of the Wasatch Solar Challenge is to improve each jurisdiction’s score by adopting simplified, streamlined, and standardized local solar processes.

This customized Action Plan is intended to provide a detailed overview of Summit County’s solar permitting and inspection processes, identify best practices, and provide priority recommendations (see Table ES1) to improve Summit County’s overall solar score. The proposed strategies were developed in concert with representatives of Summit County’s Building and Sustainability Departments and reflect feedback from numerous Wasatch Solar Challenge workshops and individual consultations. This plan is intended to serve as a tool and guide for the Summit County Council, and Summit County’s Building, Zoning, and Sustainability Departments as they continue efforts to simplify and streamline their internal solar processes.

Summit County has made significant strides to remove unnecessary and costly governmental barriers to solar adoption; within a year, the Summit County Building Department implemented nearly all the best practices prescribed by the Wasatch Solar Challenge, including adopting a flat $50 fee for residential solar permits. With a continued focus on process improvements and maintenance of the best practices outlined in the Action Plan, Summit County stands poised to be recognized as one of the most solar-friendly communities in Utah and the nation.

The Path to U.S. Solar is Riddled with Red Tape

A standard rooftop solar photovoltaic (PV) electricity generation system installed in the United States today costs nearly twice as much as the exact same system installed on a rooftop in Germany. Although the U.S. has a significantly better solar resource than Germany and relatively lower costs for most commercial goods and services, the home of the Red, White, and Blue has a sizeable problem: Red Tape. Across the United States, solar customers and installers face an incomprehensible patchwork of permitting, zoning, and interconnection rules from more than 18,000 cities and 3,000 utilities. Despite the rigorous national standards for safety and code compliance for solar, there is no standardized national approach to local solar processes. Every town, county, state, and utility service territory has a different set of ordinances, procedures, and regulations. The result is a disjointed and unpredictable system of permitting procedures, interconnection processes, zoning ordinances, and solar regulations that all take time and money to navigate. Recent studies have shown that local government rules and procedures can have an enormous impact on the out-of-pocket price paid by the solar consumer—adding around $2,500 to the cost of a residential solar installation. For an average residential system, that can amount to nearly half of the total installed system cost.

Over the past four years, the price of a residential solar PV system has declined from over $8 per watt in 2008 to about $5 per watt in 2012, making solar an increasingly attractive investment for homeowners. These price declines, however, are largely attributable to falling solar PV module (or panel) prices, which fell by $2 per watt from 2008 to 2011 and continued to decline through 2012. The hardware costs, or “hard” costs, of solar PV include the panels, mounting equipment, inverters, conduit, and wires. While continual improvements and breakthroughs are helping to reduce the hard costs of solar PV, the single biggest challenge to reducing solar prices in the U.S. is the non-hardware costs – or “soft costs”.

“Soft costs” associated with permitting, application approval time, fees, inspections, utility interconnection procedures, zoning variance requests, customer acquisition costs, and other administrative costs currently make up approximately 30-40% of the total installed cost of rooftop solar PV. The most significant “soft costs” are permitting and interconnection fees and the labor associated with regulation
In spite of the tremendous benefits that solar provides locally and nationally in terms of economic development, jobs, improved air quality, grid stability and energy security, solar customers are often burdened with inequitable fees and delays associated with solar PV’s soft costs. Increased costs and complexity discourage investment, which limits market growth, competition, and economies of scale—all of which further contribute to higher-than-necessary solar costs and diminished benefits to the consumer, the economy, and society. Indeed, decisions made at the local level are some of the most important drivers of solar costs and, ultimately, may determine the competitiveness of the U.S. solar market.

Rooftop Solar Challenge Clearing the Path

Fortunately, the solar game is changing with a national effort to cut through the red tape and standardize solar processes. Numerous leading local governments are turning their attention to how their local rules and regulations impact the soft costs of solar. As part of the U.S. Department of Energy’s SunShot Initiative and Rooftop Solar Challenge, twenty-two teams of local governments and organizations are working to streamline solar processes and reduce costs to their citizens and businesses by adopting standardized solar best practices.6 The Rooftop Solar Challenge is part of the DOE’s SunShot Initiative, which aims to make subsidy-free solar energy cost-competitive by the end of the decade, achieving $1.50 per watt cost-competitive by building an online business-to-business marketplace to connect the solar industry representatives, and investigating strategies to standardize the solar market across the participating jurisdictions.

Each jurisdiction received a score comparing their local permitting and zoning processes to DOE Rooftop Challenge Solar Permitting Best Practices. Each score indicates how close (or far) a jurisdiction is from achieving national best practices in each category; it is assumed that adopting best practices will translate to lower costs, simpler processes, and standardized protocols.7 The goal of the Wasatch Solar Challenge is to improve each jurisdiction’s score by adopting simplified, streamlined, and standardized local solar processes.
Summit County’s Action Plan for Simplified Solar

This customized Action Plan is intended to provide a detailed overview of Summit County’s solar permitting and inspection processes, identify best practices, and provide priority recommendations to improve Summit County’s overall solar score. The proposed strategies were developed in concert with representatives from Summit County’s Building and Sustainability Departments and reflect feedback from numerous Wasatch Solar Challenge workshops and individual consultations. This Action Plan aims to serve as a relevant tool and guide for the Summit County Council, and Summit County’s Building, Zoning, and Sustainability Departments as they continue leading the way to simplified and streamlined solar processes. A corollary zoning guideline document, available online at www.solarsimplified.org, provides more detailed information on solar zoning-related issues and strategies to align Summit County’s zoning with best practices.

Summit County has made significant strides to remove unnecessary and costly governmental barriers to solar adoption; within a year, the Summit County Building Department implemented nearly all the best practices prescribed by the Wasatch Solar Challenge. With a continued focus on process improvements and maintenance of the best practices outlined in the Action Plan, Summit County stands poised to be recognized as one of the most solar-friendly communities in Utah and the nation.

Solar Permitting Resources for Local Building Officials

Local officials tasked with permitting and inspecting solar installations don’t need to go far to learn more about solar technologies and stay up to date on solar technologies. Several free online resources are available to provide training and information:

➤ FREE on-line Solar Code Official Training at www.ritelearning.org/course-details/csid-400 The 4-hour online class will give code officials 6 continuing education units and was developed and approved by the US Department of Energy.

➤ One-Stop-Shop Solar in Utah at www.SolarSimplified.org. Developed by the Wasatch Solar Challenge, this website provides Utah-specific solar permitting, zoning, and code information, along with an interactive solar map, solar calculator, and other helpful resources. The site is designed to serve as a one-stop-shop for local governments, solar customers, installers, and utilities to help streamline, simplify, and standardize the solar process across the State.

➤ Solar Outreach Partnership at www.SolarOutreach.org. Designed to help accelerate solar energy adoption on the local level by providing best practices, resources, and technical assistance to local governments, this site provides a comprehensive library of reports and information on solar-friendly practices geared towards local governments.

➤ National Solar Permitting Database at www.SolarPermit.org. This community-based, free online tool compiles the most complete and accurate permitting requirements from solar professionals and Authorities Having Jurisdiction (AHJs) from around the United States in one single online location. Users will be able to search the database quickly for complete and accurate information on permitting requirements and other relevant information about AHJs.

Cutting Solar Costs, Not Corners

The solar industry certainly recognizes the valuable role that local governments (and utilities) serve in reviewing solar permit plans, inspecting systems, and connecting solar to the grid. Solar permitting and interconnection processes are essential to guaranteeing safety and compliance with existing building codes, while also ensuring quality control and preventing substandard work.

However, diverse authorities rarely share a consistent approach or standard protocol for solar regulations. From state and local governments, utilities, and utility regulators, to planning and zoning commissions, building inspectors, and fire code officials, each jurisdiction, and often each individual, has a unique approach to solar. A lack of solar-specific training, education, and exposure among officials often results in further inconsistencies in how existing rules are enforced. This inconsistency in approaches to solar processes arguably does little to improve safety and may, in fact, compromise safety in the long run.

Perspectives on Solar Permitting

### Solar Installer Perspective on Solar Permitting

- Varying requirements across jurisdictions create confusion, rework, and frictional costs
- Requirements within the same jurisdiction suffer from inconsistent application
- Requirements are not readily accessible and can be updated without notice
- Inconsistent processing and cycle times disrupt sales and operations flows (e.g. scheduling staff time, routing crews, and site visits to customers)

### Local Official Perspective on Solar Permitting

- Installer errors and incomplete/inconsistent paperwork (e.g. design doesn’t match documents) creates extra work and delays
- Local officials are often under-resourced and over-tasked
- No channel to communicate updates or simplification of processes to installers
- Solar installations are uncommon, governments are unaware of existing best practices or that a problem even exists

Understanding that solar is a relatively new technology for many building officials, the solar industry and solar advocates continue to prioritize ongoing solar PV code trainings to improve familiarity with solar technology and reduce time and costs associated with solar project review and inspection (see Solar Permitting Resources for Local Officials).

**Time is Money**

Time spent acquiring, completing, and submitting permit forms, waiting for approval, and waiting for multiple inspections all add costs to the contractor, which are in turn passed on to customers. By expediting these processes, jurisdictions can simultaneously reduce costs and be more business-friendly. Finding balance between permitting costs and safe processes, without placing undue burdens on the solar industry, is critical to the “soft cost” puzzle.

Fortunately, standard solar technologies and solar installations are required to adhere to a set of rules set forth by the International Residential Code (IRC) and National Electrical Code (NEC). Most residential and small commercial rooftop solar systems follow similar design standards with little variation in technology or design protocol. Employing a standard permit process for the most common systems can save time and costs for all involved (see Figure 2). Appendix A provides an expedited solar PV permitting application template, which was developed by the Solar America Board for Codes and Standards (Solar ABCs) for national dissemination (supported by the DOE). The Wasatch Solar Challenge has modified this standard permit, providing specific requirements for wind and snow loading.

Adopting the Solar ABCs forms and process is one of the easiest and cheapest ways for a local government to reduce time spent applying for and reviewing solar permits. What’s more, as more jurisdictions adopt this expedited permitting process, the country will be one step closer to a more uniform solar process, which will yield significant economic benefits for decades to come.

**Money is Money**

The solar industry recognizes that local governments need to charge reasonable fees to cover the work-hours necessary to perform quality reviews and inspections. Jurisdictions can simultaneously ensure safe solar installations and cover costs by adopting reasonable permit fees in line with cost recovery (see Appendix B), in lieu of the more common approach to assess fees based on the total value of solar PV systems (which can quickly add up to several thousand dollars in fees alone).

<table>
<thead>
<tr>
<th>Process for Local Permitting and Inspections</th>
<th>Average cost per Install</th>
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<tr>
<td>Complete Permit Application</td>
<td>$505</td>
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<tr>
<td>Draw system plans</td>
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<td>Structure calculations</td>
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<td>Zoning application</td>
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<tr>
<td>Determine requirements</td>
<td>$27</td>
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<td>Print out permit package</td>
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<td>Delay</td>
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<td>Submit permit application in person</td>
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<td>Pay permit fee</td>
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<td>Variation in build requirements</td>
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<td>Smaller system due to fire setbacks</td>
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<td>Unable to install supply side tab</td>
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<td>Add extra disconnect</td>
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<td>Labeling</td>
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<tr>
<td>Double flashing</td>
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<td>Field Inspections</td>
<td>$329</td>
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<td>Wait for inspector</td>
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<td>Travel to and from customer’s home</td>
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<td>Rework and re-inspection</td>
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<td>Inspector conducts inspection</td>
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<td>Sales and marketing cost</td>
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<td>Lower close rates from higher cost</td>
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<tr>
<td>Cancellations due to delay</td>
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<tr>
<td>Reduced customer referrals</td>
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<td>Total Cost</td>
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**Immediate Solution**

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<td>$46</td>
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<td>Solar ABCs Standards 80%</td>
<td>$77</td>
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<td>Email submission 100%</td>
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<td>Solar ABCs Standards 50%</td>
<td>$101</td>
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<td>Solar ABCs Standards 100%</td>
<td>$167</td>
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<tr>
<td>Standardize (reduce rework) 50%</td>
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<td>Standardize (still need labels) 50%</td>
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<td>$26</td>
</tr>
<tr>
<td>Reduce inspection windows 100%</td>
<td>$243</td>
</tr>
<tr>
<td>Reduce inspection windows 80%</td>
<td>$96</td>
</tr>
<tr>
<td>Standards (less installer staffing) 50%</td>
<td>$48</td>
</tr>
<tr>
<td>Eliminate multiple inspections 100%</td>
<td>$60</td>
</tr>
<tr>
<td>Standards (reduce rework) 80%</td>
<td>$32</td>
</tr>
<tr>
<td>Standards (farer inspection) 50%</td>
<td>$7</td>
</tr>
<tr>
<td>All Solutions 85%</td>
<td>$440</td>
</tr>
<tr>
<td>All solutions 80%</td>
<td>$320</td>
</tr>
<tr>
<td>Rapid response, standardize 100%</td>
<td>$70</td>
</tr>
<tr>
<td>All solutions 100%</td>
<td>$50</td>
</tr>
<tr>
<td>All of the above 76%</td>
<td>$1,906</td>
</tr>
</tbody>
</table>

**Figure 2** Cost and Time Savings from Adopting Solar ABCs and Best Practices

*Total installed cost of rooftop solar PV.*
Community Benefits of Streamlined Solar

Fortunately, local governments and local officials have the power and ability to cut through red tape, identify areas ripe for standardization, and streamline local solar processes—all of which can make solar more affordable for homeowners and businesses. Not to mention, adoption of streamlined and standardized processes can help reduce staff-time and resources needed to process solar-related requests. Cutting costs and complexity internally makes for a more cost-effective and efficient local government—an added benefit to taxpayers!

Not only will these concerted efforts lead to greater market certainty and reduced costs for the solar industry and end-users, but communities with solar-friendly rules can better attract economic activity stemming from solar market growth. More dollars circulating in the local economy, more revenue, and more jobs all have a positive ripple effect throughout a community.

Lastly, as communities remove barriers to solar adoption, more individuals and businesses will be primed to invest in an inexhaustible, homegrown, secure, and economic energy resource—one that simultaneously improves air and water quality, mitigates risks and costs associated with disruptive climate change, and preserves finite resources for future generations.

With little to lose and a lot to gain, local governments across the country are taking the scissors to solar red tape and empowering their communities with clean, secure, local solar energy.

Solar Stats: Roof Space is a Precious Commodity

- Solar PV systems consist of arrays of individual panels that are wired together to achieve a higher electrical output. Panel sizes vary depending on the model and wattage.
  - On average, a 200-250 Watt panel requires approximately 15 to 25 square feet of roof space.
  - To generate one kilowatt (1000 watts) of power requires approximately 75-100 square feet of roof space, depending on the panel used.
  - One kilowatt of solar PV will generate, on average, 1400 kilowatt-hours of electricity annually in northern Utah.
  - The average Utah home uses approximately 9000 kilowatt-hours of electricity annually (this is not necessarily a highly energy efficient home, and likely has a lot of gadgets).
  - A solar PV system sized to meet 100% of an average Utah home’s annual electricity needs would be approximately 6.7 kilowatts, which would require upwards of 700 square feet of roof space.
  - The average solar PV system size is 3-4 kilowatts, which require upwards of 400 square feet of roof space.
  - Shading, pipes, chimneys, and fire access requirements all limit the available roof space suitable for solar. Local regulations or requirements that unreasonably limit the amount of roof space for solar can seriously hinder the viability of solar projects.

The Rooftop Solar Challenge identified and categorized solar permitting best practices, assigning a point system to evaluate and score existing practices. A total score of 460 for permitting indicates that a jurisdiction has adopted all the recognized best practices for solar permitting and has the procedures in place to make solar a fast, simple, and streamlined process for all parties (including the jurisdiction staff tasked with reviewing the permit).

At the onset of the Wasatch Solar Challenge in February 2012, Summit County received a Solar Permitting Score of 260 out of 460 total points. Summit County’s 2013 score increased significantly from 260 to 447, putting Summit County at the head of the class for permitting improvements during the Wasatch Solar Challenge. It is important to note that the 2013 score does not take into account any improvements that are currently in process or planned, including the temporary permit fee reduction for residential solar from $385 to $50, which will be available to County homeowners for the remainder of 2013 (long-term changes to the fee schedule have not been considered yet). As such, it is highly likely that Summit County’s efforts will yield a considerably improved score over the coming months and years, provided that Summit County continues to focus on aligning current practices with best practices.

Not only will these concerted efforts lead to greater market certainty and reduced costs for the solar industry and end-users, but communities with solar-friendly rules can better attract economic activity stemming from solar market growth. More dollars circulating in the local economy, more revenue, and more jobs all have a positive ripple effect throughout a community.

Lastly, as communities remove barriers to solar adoption, more individuals and businesses will be primed to invest in an inexhaustible, homegrown, secure, and economic energy resource—one that simultaneously improves air and water quality, mitigates risks and costs associated with disruptive climate change, and preserves finite resources for future generations.

With little to lose and a lot to gain, local governments across the country are taking the scissors to solar red tape and empowering their communities with clean, secure, local solar energy.

Solar Best Practices: How Does Summit County’s Permitting Stack Up?

The score above addresses five action areas, which represent the main categories that comprise solar permitting: Information Access, Timing, Number of Approvals Required, Expedited Model Processes, and Fees. Table 2 on the next page provides a description of what each Action Area entails.

Table 1 | Solar Permitting Best Practices Score for Summit County

| DOE Rooftop Solar Challenge Solar Permitting Best Practices Score | 460 points |
| SUMMIT COUNTY’S 2012 SOLAR PERMITTING SCORE (Pre-Wasatch Solar Challenge) | 260 points |
| SUMMIT COUNTY’S 2013 SOLAR PERMITTING SCORE (Post-Wasatch Solar Challenge) | 447 points |
These Action Areas are expanded upon in detail for Summit County in the tables below, each of which identifies the following:

- Summit County’s current practices in a given Topic Area;
- Best Practices in that Topic Area;
- Strategies and plans to achieve best practices; and
- Benefits of those best practices for the jurisdiction, industry, and residents.

### Table 2 | Solar Permitting Action Areas and Description

<table>
<thead>
<tr>
<th>Action Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Access</td>
<td>How and where solar installers and citizens obtain information on solar permitting (e.g. online, in-person, via email)</td>
</tr>
<tr>
<td></td>
<td>Ease of permit application and submittal process</td>
</tr>
<tr>
<td></td>
<td>How and where permit progress is tracked</td>
</tr>
<tr>
<td></td>
<td>Solar contacts within the jurisdiction</td>
</tr>
<tr>
<td>Timing</td>
<td>The amount of time different steps in the permit process require to complete</td>
</tr>
<tr>
<td></td>
<td>Adoption of any means to accelerate the solar process and thereby decrease costs</td>
</tr>
<tr>
<td>Number of Approvals Required</td>
<td>Number of applications required for submittal</td>
</tr>
<tr>
<td></td>
<td>Number of approvals required</td>
</tr>
<tr>
<td></td>
<td>Amount of paperwork and number of professional verifications required</td>
</tr>
<tr>
<td>Expedited Processes</td>
<td>Adoption of a standardized expedited permitting process</td>
</tr>
<tr>
<td></td>
<td>Adoption of Solar American Board of Codes and Standards (Solar ABCs)</td>
</tr>
<tr>
<td></td>
<td>Expedited Solar PV Permitting Process forms modified with wind and snow loads for Utah</td>
</tr>
<tr>
<td>Fees</td>
<td>Reasonable fees and fee structures</td>
</tr>
</tbody>
</table>

### Gearing Up for Solar Success

Summit County is proactively exploring and carefully considering improvements to its solar permitting processes and zoning ordinances in anticipation of future solar market growth. The price of solar has fallen dramatically in recent years, and more Summit County residents and businesses are eager to adopt solar. In addition, a community-led bulk purchase initiative in 2013 is slated to significantly increase the number of residential solar installations in Summit County (and, hence, the number of solar permits requested). As such, improvements to Summit County’s permitting process are quite timely.

Summit County has a number of important pieces of the permitting puzzle already in place, all of which help to simplify and streamline the process. Particularly notable are Summit County’s adoption of the Solar ABC’s Expedited Permitting Process, their easy-to-use Solar Permitting Checklist and Online Permitting System, all of which save considerable time and resources for staff and solar customers.

Most recently, Summit County decided to reduce the residential solar permit fees from $385 to $50 for the remainder of 2013, to support the Summit Community Solar initiative (a limited-time, community-led bulk-purchasing effort for residential solar [www.mycommunitysolar.org/summit]). On many fronts, Summit County is ahead of the curve and leading the Wasatch Solar Challenge pack!

As Summit County continues to hone in on ways to streamline solar for its citizens and businesses, there are additional actions the County should consider in order to maintain a simple solar process over the years, attract new solar market growth locally, and achieve well-earned recognition for their leadership on solar permitting.

### Table 3 | Top 5 Actions Summit County Can Take to Reduce Solar Costs and Streamline the Solar Permitting Process

<table>
<thead>
<tr>
<th>Priority Action Item</th>
<th>Level of Difficulty</th>
<th>Timeframe</th>
<th>Action Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pursue “Platinum Level” Solar Friendly Communities Designation</td>
<td>Low</td>
<td>On-going</td>
<td>All Action Areas</td>
</tr>
<tr>
<td>2. Adopt Tiered Fee Structure for all Solar Projects (see Appendix B)</td>
<td>High</td>
<td>Mid-term 1-2 years</td>
<td>Fees</td>
</tr>
<tr>
<td>3. Host and/or Participate in Available Solar PV Code Trainings</td>
<td>Low</td>
<td>On-going</td>
<td>All Action Areas</td>
</tr>
<tr>
<td>4. Maintain Up-to-date Information on Summit County Solar Permitting Website</td>
<td>Low</td>
<td>On-going</td>
<td>Information Access and Inspections</td>
</tr>
<tr>
<td>5. Mentor Other Jurisdictions on Solar Best Practices</td>
<td>High</td>
<td>Mid-term 1-2 years</td>
<td>All Action Areas</td>
</tr>
</tbody>
</table>

Each of these recommendations and additional recommendations for each Action Area are described in further detail on the next page.
Information Access

Easy access to solar permitting information can provide immediate time and cost-saving benefits for all parties. With more information and processes online, fewer vehicle trips need to be made to the permitting office, fewer staff-hours are taken up answering questions, and wait times are reduced. Table 4 compares Summit County’s practices to best practices for information access, including where permit applications are made available, how completed permits may be submitted, and where interested parties can gather information on their solar permit status.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Where is the solar permit application accessible?</td>
<td>Allow online permitting</td>
<td>Available to the public online</td>
<td>Summit County has achieved all of the best practices for Information Access Protocols.</td>
</tr>
<tr>
<td>How do I submit the permit application?</td>
<td>Allow online permitting</td>
<td>Entire permitting process (including submissions) is available online</td>
<td>Some additional steps the County should consider are as follows:</td>
</tr>
<tr>
<td>How is the permitting process information accessible?</td>
<td>Make all permitting information easily accessible online</td>
<td>Easily accessible to the public online</td>
<td>• Adopt electronic, user-interactive Solar ABCs forms for all types of solar PV systems (see Appendix A)</td>
</tr>
<tr>
<td>Is there an accessible designated point of contact for solar permitting?</td>
<td>Assign a designated point of contact, knowledgeable and familiar with solar</td>
<td>Designated point of contact available</td>
<td>• Maintain regular updates to on-line solar permitting information.</td>
</tr>
<tr>
<td>Where is information on permit fees made available?</td>
<td>Put information online</td>
<td>Available to the public online</td>
<td>• Train building and inspection staff regularly to ensure all are familiar with and able to safely and efficiently process and inspect solar permits.</td>
</tr>
<tr>
<td>How is information on inspection requirements made available?</td>
<td>Put information online</td>
<td>Available to the public online</td>
<td>• To facilitate standardization across jurisdictions, share best practices with and/or mentor surrounding jurisdictions on streamlined solar processes and online permitting.</td>
</tr>
</tbody>
</table>

Benefits of Best Practices

• Applicants and permit reviewers save both time and money
• Decrease driving miles and wait times
• Attract local solar development
• Permit projects faster and cheaper

Timing

The amount of time that each step in the solar permit application process takes to complete directly impacts the costs that installers have to pass along to their customers and the time that Summit County staff has to spend reviewing and inspecting projects. Improvements in this Action Area can simultaneously accelerate the solar installation process and decrease costs. Table 5 summarizes Summit County’s practices relative to best practices on the issues relating to solar permit timing, including application review time, approval time, time between approval and inspection, and the time spent waiting for a local inspection to occur.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the average time required to complete a permit application?</td>
<td>Residential applications can be completed in a half day or less. Commercial applications can be completed in one day or less</td>
<td>Residential applications can be completed in a half day, and commercial applications in one day.</td>
<td>Summit County has achieved all of the best practices for Timing Protocols.</td>
</tr>
<tr>
<td>Is there a policy to issue/deny permits within a specified number of days?</td>
<td>Does the jurisdiction track the number of days each permit takes to process?</td>
<td>Establish a policy to render a decision in within 3-5 business days.</td>
<td>Some additional steps the County should consider are as follows:</td>
</tr>
<tr>
<td>Does the jurisdiction track the number of days each permit takes to process?</td>
<td>What is the average number of business days between application submission and decision?</td>
<td>Track the time permits take to complete the process.</td>
<td>• Adopt electronic, user-interactive Solar ABCs forms for all types of solar PV systems, to ensure a quick process for different solar PV project types (see Appendix A).</td>
</tr>
<tr>
<td>What is the average number of business days between application submission and decision?</td>
<td>What is the average number of business days from inspection request to actual inspection?</td>
<td>Provide a decision on each permit application within three business days.</td>
<td>• Train building and inspection staff regularly to ensure all are familiar with and able to safely and efficiently process and inspect solar permits.</td>
</tr>
<tr>
<td>What is the typical window of time given to the installer for final onsite inspection?</td>
<td>What is the typical window of time given to the installer for final onsite inspection?</td>
<td>Inspection occurs less than two days from inspection request.</td>
<td>• To facilitate standardization across jurisdictions, share best practices with and/or mentor surrounding jurisdictions on fast and efficient solar processes.</td>
</tr>
<tr>
<td>Reduce the inspection appointment windows to two hours or less</td>
<td></td>
<td>Contractors can call the morning of their inspection and schedule a time within a two hour window</td>
<td></td>
</tr>
</tbody>
</table>

Benefits of Best Practices

• Faster decisions on permitting applications, shorter wait times, improved customer service
• Reduced lag time for solar projects
• More installers eager to do business in Summit County and stimulate local economic activity
Number of Approvals and Inspections Required

As approvals and inspections take time to complete, limiting the number of steps required to ensure safety and adherence to local building and fire codes can save time for both the local government staff and solar customers and installers. Limiting the number of inspections reduces the need for time-consuming waiting periods (as identified above), excessive trips to job sites, and per-hour costs associated with any professional approvals (engineers, inspectors, etc.). Table 6 summarizes the number of separate solar applications that must be submitted across Summit County’s departments, the number of departments that must review and approve a permit application, and the number and type of inspections that take place during and after the solar installation.

Table 6 | Solar Permitting Approval and Inspection Protocols in Summit County, a Comparison with Best Practices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>How many departments require applications?</td>
<td>One</td>
<td>One</td>
<td>• Explore ways to streamline the process for commercial solar PV systems, including eliminating extra approvals.</td>
</tr>
<tr>
<td>What types of departmental approvals are required?</td>
<td>Eliminate reviews that do little to validate the safe and efficient operation of a proposed PV system</td>
<td>Eliminate reviews that do little to validate the safe and efficient operation of a proposed PV system</td>
<td></td>
</tr>
<tr>
<td>What approvals from Prof. Engineers are required?</td>
<td>Eliminate multiple inspections</td>
<td>Commercial: Electrical, Mechanical, and Structural; Residential: Structural</td>
<td></td>
</tr>
<tr>
<td>How many separate inspection trips are required?</td>
<td>One application to one department saves time and money</td>
<td>Single inspection (typically)</td>
<td></td>
</tr>
</tbody>
</table>

Benefits of Best Practices

• One application to one department saves time and money
• Eliminating excessive reviews from expensive professionals reduces the total cost to the customer without compromising safety
• Officials with solar-specific training can speed up the process and ensure proper safety protocols have been met

Model Expedited Permitting Process

Summit County is one of the first Utah communities to formally adopt the Solar ABCs Expedited Solar PV Permitting Process, which is helping to decrease solar soft costs and contributing to greater national standardization for solar permitting. The Wasatch Solar Challenge has modified the Solar ABCs expedited permitting form to account for wind and snow loading in higher elevation areas of Utah. (see Appendix A). This form will allow for quicker and easier reviews of solar permits for average residential rooftop systems or small commercial rooftop systems of less than 15 kilowatts. Table 7 outlines the status of Summit County’s adoption of the model Solar ABCs expedited permitting process and identifies additional steps Summit County can take to apply the expedited process to more solar technologies.

Table 7 | Adoption of Model Expedited Permitting Process in Summit County, a Comparison with Best Practices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adopt a standardized model process</td>
<td>Summit County has adopted the Solar ABCs expedited permitting document and integrated them into its online permitting system.</td>
<td>Summit County has established itself as a solar leader through its adoption of the expedited Solar ABCs permitting process. The following are recommendations for continued solar success:</td>
<td></td>
</tr>
<tr>
<td>• Adopt the Solar ABCs expedited permitting process and forms, modified to meet local needs.</td>
<td>• Adopt a simple solar PV checklist and post on-line</td>
<td>• Adopt electronic, user-interactive Solar ABCs forms for all types of solar PV systems, to ensure a quick process for different solar PV project types (see Appendix A).</td>
<td></td>
</tr>
<tr>
<td>• Adopt a simple solar PV checklist and post on-line</td>
<td>• Allows for simpler and quicker plan reviews, saving staff time and resources</td>
<td>• Train staff members regularly to ensure all are familiar with the expedited solar permitting forms and checklist.</td>
<td></td>
</tr>
<tr>
<td>Benefits of Best Practices</td>
<td>Creates greater standardization for solar in line with national goals</td>
<td>• Encourage surrounding jurisdictions to adopt the Solar ABCs expedited solar permitting process, forms, and simplified solar checklist.</td>
<td></td>
</tr>
</tbody>
</table>

• Enables staff to more easily detect applications submitted incorrectly
• Reduces the number of department approvals, saving local government resources and staff time

Meeting or Exceeding Best Practices

In Process - or - Near Best Practices

Not Meeting Best Practices
Fees

Adopting an appropriate fee structure for solar permits is critically important to minimizing excessive solar costs. Local governments must strike a balance that allows for jurisdictional cost recovery without adding unreasonable costs to solar development. This is one of the most tangible areas where soft cost can be reduced. An unfortunately common approach to fees uses a value-based system, whereby the solar permit fee is determined based on the total cost of the solar energy system. For medium-sized to larger systems, this cost can be tens or hundreds of thousands of dollars. According to best practices, the fees for solar PV permits should instead be correlated directly with the time spent by local staff reviewing solar PV permits and inspecting projects and should utilize a flat or tiered structure. Appendix B provides a sample tiered fee structure for systems of differing sizes; this fee structure has been reviewed and approved by Utah solar installers and is considered a best practice in Utah. Since most solar energy systems are fairly standard, the amount of time necessary to conduct the reviews and inspections should be expedited once a common level of understanding and familiarity is achieved among staff. Summit County has reduced the permit fee for residential solar from $385 to $50 through the end of 2013. While temporary, this approach is in-line with best practices and should be considered for permanent adoption, along with the tiered fee schedule outlined in Appendix B, to account for systems of all sizes. Table 8 summarizes Summit County’s current fee structure as it relates to national best practices.

<table>
<thead>
<tr>
<th>Table 8</th>
<th>Fee Structure in Summit County, a Comparison with Best Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACTION AREA:</strong> Fee Structure Protocol</td>
<td><strong>Best Practices</strong></td>
</tr>
<tr>
<td>Fees</td>
<td>Establish reasonable fees correlated with solar PV system size (with tiers or size caps). Base fees on internal cost recovery, not the total cost or value of the solar PV project.</td>
</tr>
<tr>
<td>Fee Structure</td>
<td>Adopt a tiered fee structure that aligns with jurisdictional cost recovery</td>
</tr>
<tr>
<td>Benefits of Best Practices</td>
<td>• An appropriate fee structure will ensure that the building department can recover applicable staff time and costs associated with issuing solar permits, while also providing reasonable and predictable costs for solar customers. • A favorable fee structure can help drive solar adoption; reduce the total price of solar; and increase the environmental benefits associated with more solar-powered homes and buildings within the community.</td>
</tr>
</tbody>
</table>
EXPEDITED SOLAR PV PERMIT (adapated from Solar ABCs)

Appendix A

EXPEDITED SOLAR PV PERMIT PROCESS FOR PV SYSTEMS

Required Information for Permit:

1. Site plan showing location of major components on the property. This drawing need not be exactly to scale, but it should represent relative location of components at site (see supplied example site plan). PV arrays on dwellings with a 3' perimeter space at ridge and sides may not need separate fire service review.
2. Electrical diagram showing PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, and ac connection to building (see supplied standard electrical diagram).
3. Specification sheets and installation manuals (if available) for all manufactured components including, but not limited to, PV modules, inverter(s), combiner box, disconnects, and mounting system.

Step 1: Structural Review of PV Array Mounting System

Is the array to be mounted on a defined, permitted roof structure? Yes □ No □
If No due to non-compliant roof or a ground mount, submit completed Structural Worksheet on the next page.

Roof Information:

1. Is the roofing type lightweight (Yes = composition, lightweight masonry, metal, etc….) __________________________
   If No, submit completed worksheet for roof structure WKS1 (No = heavy masonry, slate, etc….)__
2. Does the roof have a single roof covering? Yes □ No □
   If No, submit completed worksheet for roof structure WKS1
3. Does the roof have a single roof covering? Yes □ No □
   If No, submit completed worksheet for roof structure WKS1
4. Provide method and type of weatherproofing roof penetrations (e.g. flashing, caulk) __________________________

Mounting System Information:

1. Is the mounting structure an engineered product designed to mount PV modules? Yes □ No □
   If No, provide details of structural attachment certified by a design professional.
2. For manufactured mounting systems, fill out information on the mounting system below:
   a. Mounting System Manufacturer __________________________ Product Name and Model# __________________________
   b. Total Weight of PV Modules and Rails __________________________ lbs
   c. Total Number of Attachment Points __________________________
   d. Weight per Attachment Point (lbs) __________________________ (if greater than 45 lbs, see Structure Wks1)
   e. Maximum Spacing Between Attachment Points on a Rail (inches) __________________________ (see product manual for maximum spacing allowed based on maximum design wind speed)
   f. Total Surface Area of PV Modules (square feet) __________________________ ft²
   g. Distributed Weight of PV Module on Roof (lbs/ft²) __________________________
   If distributed weight of the PV system is greater than 5 lbs/ft², see WKS1.

Step 2: Electrical Review of PV System (Calculations for Electrical Diagram)

In order for a PV system to be considered for an expedited permit process, the following must apply:

1. PV modules, utility-interactive inverters, and combiner boxes are identified for use in PV systems.
2. The PV array is composed of 4 series strings or less per inverter, and 15 kW or less.
3. Electrical diagram showing PV array configuration, wiring system, overcurrent protection, inverter, disconnects, required signs, and ac connection to building (see supplied standard electrical diagram).
4. If the electrical system is more complex than the standard electrical diagram can effectively communicate, provide an alternative diagram with appropriate detail.

Snow and Wind Information

Please refer to the snow and wind potential chart

1. What is the ground snow load at the system location? __________________________
2. What is the designed wind load of the system? __________________________
Calculate snow and wind potential load from WKS1 and attach the calculations to this application

3. For rooftop systems, does the top chord have sufficient capacity to hold point loads produced by the ground snow and wind loads combined with the dead loads of the system and the roofing material? Yes □ No □
4. What is the excess capacity remaining in the top chord taking into consideration dead loads and wind and snow load? __________________________

Express the excess capacity as a percentage of the International Residential Code’s live load requirements (20 psf): __________________________ If the percentage is less than 100, please refer to WKS1

Structure Worksheet

If array is roof mounted

This section is for evaluating roof structural members that are site built. This includes rafter systems and site built trusses. Manufactured trusses and roof joist systems, when installed with proper spacing, meet the roof structure requirements covered in item 2 below.

1. Roof construction: □ Rafters □ Trusses □ Other: __________________________
2. Describe site-built rafter or site-built truss system.
   a. Rafter Size: _____ x _____ inches
   b. Rafter Spacing: _____ inches
   c. Maximum unsupported span: _____ feet, _____ inches
   d. Are the rafters over-spanned? Yes □ No □
   e. If Yes, complete the rest of this section.
3. If the roof system has
   a. over-spanned rafters or trusses,
   b. the array over 5 lbs/ft² on any roof construction, or
   c. the attachments with a dead load exceeding 45 lbs per attachment or
   d. Excess capacity after the summation of dead loads, with snow and wind loads of less than IRC requirements for live loads,

   It is recommended that you provide one of the following:
   i. A framing plan that shows details for how you will strengthen the rafters.
   ii. Confirmation certified by a design professional that the roof structure will support the array.

If array is ground mounted:

1. Show array supports, framing members, and foundation posts and footings.
2. Provide information on mounting structure(s) construction. If the mounting structure is unfamiliar to the local jurisdiction and is more than six (6) feet above grade, it may require engineering calculations certified by a design professional.
3. Show detail on module attachment method to mounting structure.

Zoning Related Items

1. Does the property have zoning restrictions due to its location (ie Historic District, Historic Home, Forest, Canyon, etc)? Yes ☐ No ☐

   If Yes, please explain the restrictions and the circumstances that will allow the system to receive a variance:

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

2. Are there any private covenants (For example Homeowners Associations) that can claim jurisdiction over the property? Yes ☐ No ☐

   If Yes, please provide a written letter of approval from the governing body of the covenant for the system that is to be installed.

   _______________________________________________________
   _______________________________________________________
   _______________________________________________________
   _______________________________________________________

After completing this section please provide technical details about the system by using the standard forms on the following pages. If the electrical system is more complex than the standard electrical diagram can effectively communicate, please provide an alternative diagram with appropriate detail.
PERMITTING FORMS FOR OTHER SYSTEM TYPES:

The standard form provided with this document covers only one type of solar PV system, as such it will not be applicable for all projects. The following links from the Solar America Board for Codes and Standards provide similar standard expedited permit forms for the other main types of small-scale solar PV installations.

- Micro-Inverter:

- AC Module:

- Supply-Side Connection forms:
  [http://www.solarabcs.org/about/publications/reports/expedited-permit/pdfs/Example4-Supply-SideConnection.pdf](http://www.solarabcs.org/about/publications/reports/expedited-permit/pdfs/Example4-Supply-SideConnection.pdf)

The supplied Standard String Inverter system’s interactive PDF can be found at:

All of the aforementioned forms can be found at:
[http://www.solarabcs.org/permitting/](http://www.solarabcs.org/permitting/)

APPENDIX A

In lieu of a flat fee schedule, consider the following tiered Solar PV Fee Schedule*

For systems 0-4 kW: $50–$75
For systems 5-10 kW: $150
For systems 11-50 kW: $300
For systems 51-100 kW: $500
For systems 101-500 kW: $1,000
For systems 501 - 1,000 kW: $3,000
For systems 1 - 2 MW: $5,000

Explanation (from Solar ABCs Expedited Permit Process for PV Systems):
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. The scope of a PV installation is similar to that of installing a retrofitted residential HVAC system. The permitting costs for a PV system should be similar to those for an HVAC system.

Although initial plan review and field inspection costs may be slightly higher for the first few systems, those costs should reduce as the local jurisdiction becomes familiar with the installations. A subdivision of more than 10 units should be considered for an additional fee reduction based on the repetitive nature of the reviews.

The following list of steps has been adapted from Summit County's checklist and provides a template that can be enhanced with information specific to individual jurisdictions.

**The following information will be required:**

1. A complete Expedited Solar Permit Application.
2. The installing contractor’s name, license type, and number (please provide photocopy of license).
3. Application fee (also serves as the price of the permit).

**Using the application form for the most applicable type of PV system, please include:**

4. A permit application with:
   - The location of the proposed installation
   - Information about the strength of the structure to which the installation will be attached
   - Any strengthening of roofs that must take place to ensure structural safety (if applicable)
   - Information about the mounting system that will be used to construct the array
   - Any zoning-related information that may impact the installation

5. A to-scale site plan showing:
   - Equipment locations
   - Types and sizes of panels and inverters
   - Types and sizes of conduits and conductors
   - Lengths of runs
   - A grounding diagram showing electrodes and grounding electrode conductors

6. A wiring diagram showing:
   - All circuitry
   - Equipment
   - Fusing
   - Points of connection
   - Disconnects
   - Array wiring
   - Equipment grounding

7. Cut sheets and instruction manual for the inverter with the applicable model numbers highlighted and the UL or comparable listing noted.
8. Cut sheets for the PV modules, which need to include VOC rating, ISC rating, PMAX, maximum series fuse rating, voltage at PMAX and current at PMAX.
9. Cut sheets on batteries, if applicable, and connection diagrams with cable sizes.
   - Identify:
     - Battery fusing and fuse holders
     - Amp hour of battery bank
     - Charge capacity of charge system
     - Details for battery storage and venting

10. Identify wire types and connectors of all cables.
11. Provide details for array mounting and engineering for the supporting structure.
12. Verify the ability of PV systems installed on three phase supplied systems to cease to export power on loss of voltage in any phase.
13. Show all warning signs and their locations.

Ensure that all required materials have been completed and compiled and submit them to:

- Online: [www.onlinepermittingwebsite.gov]
- In Person: [Building Department Address]
- By Email to: [buildingdept@jurisdiction.gov]

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**Notes**
Endnotes


9. see note 2

10. see note 3

11. see note 4

12. see note 5

13. Customer acquisition costs (i.e. sales, marketing, and educating consumers about solar technology) are also highly variable and can add considerable costs to the total price of solar. A recent report found that the process of finding and educating consumers alone adds $670 to each kilowatt of solar installed. (NREL) The solution to customer acquisition soft costs is better public awareness and education about how solar technologies operate and ways they can be adopted. A number of groups both nationally and in Utah are working to lower these costs through education and outreach efforts.


15. For more information on the DOE Rooftop Solar Challenge, visit: http://www.energy.gov/solarchallenge.

16. For more information on the DOE SunShot Initiative, visit www.energy.gov/sunshot.

17. see note 7

18. see note 4