



Spring City power

INTERCONNECTED DISTRIBUTED POWER GENERATION Part-1: INFORMATION and EDUCATION LETTER

Homeowner Power Generation

To: All Spring City Residents and Power Customers

From: Spring City Power Advisory Board

Authorized By: Spring City Mayor and City Council

Date: February 2, 2017

The Need for and Purpose of This Letter

There is considerable interest in promoting homeowners to install independent electric-generation systems at their residence and produce power that can be supplied onto the local utility power-grid. At this time in our area, most of the activity centers around solar electric generation. [Although several other types are available and they will be briefly mentioned.] When properly implemented solar or any of the other renewable energy sources have the promise of being very beneficial in many ways.

Who Should Read This Document

All residents of Spring City and any Spring City municipal-power customer. We all participate with a shared interest in the hydropower plant at the mouth of our canyon. As a community, we collectively own the Spring City power system; and what affects one, effects all.

Definition of Key Terms Used in This Document

- **Power Generation** — The production of electrical energy by any of several processes.
- **Home Power** — The process and equipment used to produce electricity at one's private residence.
- **Interconnected** — A Home-Power system that is connected into the local power utility.



Types of Private Home-Power Generation

Although solar-electric generation is the hot topic for home-power production at this time, there are other methods available to home owners, with new ones on the horizon. Off-the-shelf technology for power generation in Spring City can be done using: Solar-Electric (Photovoltaic aka PV), Micro Hydro, Engine-Driven Generators, Wind Turbines, and Fuel Cells.

These five systems produce electricity by a different process at their frontend. However, the rest of the system is essentially the same, and will fall under the same technical requirements and regulations.

Benefits, Cautions, and Concerns Related to Private Home-Power Generation

From a purely emotional approach, it is easy to overplay the benefits of generation power at home. However, it is extremely important to keep an appropriate balance in analyzing the true cost-to-benefit ratio. A major part of this analysis, by necessity, will center on the return-on-investment measured in real dollars. It will also include things like: environmental impact, overall energy conservation, home equity, safety, self-reliance, increased homeowner's insurance costs, aesthetics, maintenance requirements, equipment life-cycle costs, and savings for future replacement of component parts as they age and fail.

With such an installation you become your own power company, which can be satisfying. However, like owning any company, there are significant obligations that come along with it.

Like any investment, the financial risks of installing a home-power system must be carefully weighed to determine if poor performance, losses due to damage, or unexpected equipment failure will result in an undue burden upon the investor/owner.

When approached logically this way, the oft' heard statement of "free energy from the sun" is put into proper perspective. The reality is that there is a significant initial investment that is gradually being returned to the investor over a number of years, with the expectation that — over time — the entire investment will be returned, at which time the installed equipment begins to actually generate a positive cash flow.



The big question is — How long will it realistically take to get to that point, and how much life is left in the equipment? All equipment has a rated useful life, and planning for repair and replacement is a part of owning it.

Since one of the big potential benefits of being your own utility company is a reduced utility payment, the offset consideration that must be remembered is that, if the system was not paid for by cash, there will be a monthly finance charge to be made. If the actual realized yearly reduction in the power utility payment is less than the finance charge on the system, the annual return on investment is negative.

Another significant point to analyze, centers around the ownership of the debt if the power-generation system is financed. Should the homeowner sell the home with the attached power system before the debt is paid off, how will the remaining finance charges be transferred to the new owner?

Cautions and Concerns from Spring City's Perspective

Safety is always first and foremost:

- For Spring City operation and maintenance personnel — interconnected power equipment must meet all national and local codes.
- Meeting these standards will automatically provide appropriate safety for the home-power-system owner and other Spring City residents.

Next comes protection for the Spring City utility equipment and infrastructure:

- Part of equipment and infrastructure protection also comes from certain limits that are placed upon the size and number of independent home-power installations that are allowed to be connected to Spring City's system. These are specifically addressed in the next section.

Last, but by no means least, Spring City Municipal Corporation feels a fiduciary responsibility to help its constituents avoid unnecessary hardships. To help accomplish this, our process includes:

- This informational letter.
- Access to general background and education on this timely topic.
- Access to people who can answer most questions in this area.
- A step-by-step process that has recommendations for the homeowner to follow, along with specific requirements that must be met before any home-power equipment can be connected into the City's system.



- All combined, this approach should give the homeowner sufficient basic information, along with key points to ponder, before making a financial commitment that might cause undue hardship.

Regulations and Limitations for Connecting to the Spring City Power System

Equipment protection and efficient operation is important to keep costs down and reliability up. For this reason, there are two limits that are placed upon the number and size of home-power systems that may be connected into the City's system.

Multiple small systems can rapidly fluctuate in their power output because of dynamic weather, generation output, and load conditions at the point of power production. Having too many small fluctuating systems attached to our infrastructure can cause imbalances and harmonics that will result in inefficient operation of the City's system, and in some cases even equipment damage. Either of these costs money that could result in increased utility charges to everyone.

- 1) **Total combined number of installed home-power system watts** that may be attached to the current Spring City system **is initially limited to a total of 50kW (50,000 watts)**. Once this 50kW limit has been reached the City will then be able to evaluate how the different feeder lines are balanced, whether proper voltage is being maintained in each area, and whether the installed transformers are adequate to handle the back-feed of power into the City's system.
- 2) **Maximum generating capacity of a home-power system** that may be connected to the Spring City System, going forward, **is limited to 5kW (5,000 watts)** — Any system that was properly installed and operational prior to the date of this letter, which exceeds 5kW, is exempt from this limit. In the event that such an over-limit system has partial or total production-capacity failure, after repairs are made, the generating capacity shall then not exceed 5kW.

Any home-power system installed before the date of this letter may not be expanded beyond its size at that time, without following the mandatory steps listed below at I.7, I.8, I.9, I.10 and II.B. Failure to comply with these steps will result in immediate disconnection from the Spring City Power System, until the system is reconfigured to its original size.



Any home-power system that is larger than 5kW that was installed before the date of this letter may not be expanded beyond its operational size at the date of this letter. If such expansion is done, the residence will be immediately disconnected from the City power system, and the customer will not be tied back into the power system until the home-power system has been de-rated to no more than 5kW.

An Option to Generate Power That Has No Size Limits

All of the discussion above relates to a grid-tied Interconnected Distributed Power Generation system. If you choose to go with an independent off-grid system — that is never to be connected to the utility power system — the above stated limits do not apply.

The major difference between an interconnected system and an independent off-grid system is that the independent off-grid system uses a battery bank to supply power when the sun is not shining.

In the case of the grid-tied system, it uses the power grid much like a battery bank. Putting excess power into the grid when it is not all being used at the point of generation, and then when the resident's power demand exceeds the power generation at the home, it draws power from the grid.

An off-grid system can give true power independence. However, in order to live what most Americans consider a normal electric power-rich lifestyle, such an independent off-grid system — of similar capacity — will be considerably more expensive than a grid-tied system, because of the large battery bank required.

It may be worth considering installing a relatively small [and therefore less expensive] independent system that is not tied in any way to the grid. Such a compact system would be purely for emergency power, to run a few important small electrical loads when the grid is down. (Things like lights, entertainment, small appliances and power tools.)

The same process as listed below will apply for an independent off-grid system, with the exception of steps A, B and C, which do not apply to such a system.



The Process to Set Up a Private Interconnected Power-Generation System

*{Items with an “ * ” are required by Spring City before allowing any independent power-generating equipment to be connected to its electric system. The other listed items are recommendations for the homeowner consideration}*

I - What to Do Before Signing Binding Contracts or Spending Significant Money

1. Get Third-Party Education and Obtain Outside Technical Support
2. Identify and Write Down Your Priorities for Investing in a Home-Power System
3. Make Realistic Economic Projections — Using Actual Full-Burden Costs and Conservative Benefit Projections
4. ***Attend the Required Spring City Home-Power Information Class**
5. Decide if You Will Contract for the Work or if it Will be a DIY Project
6. Have Contracts and Economic Projections Reviewed by Legal Council and a Certified Public Accountant
7. ***Bring Your Plans to the Planning & Zoning Commission**
8. ***Meet with a Spring City Power Company Representative**
9. ***Go Before the Spring City Council**
10. ***Obtain a County Building Permit**

II - Three More Things You'll Do Before Bringing Your System On Line

- A- ***Purchase the Specified Bidirectional Power Meter**
- B- ***Final Safety Inspection by Spring City Power Personnel**
- C- ***Spring City Power Will Perform the Actual Connection to the City System**

A Few Tips from an Interested Third Party

Spring City Municipal Corporation is a financial partner with UAMPS (Utah Associated Municipal Power Systems). Here are a few of their Solar-Customer Tips:

- How old is your roof?
- Who gets the energy tax credit?
- Have you interviewed multiple contractors?
- Is your preferred solar-panel location shaded?
- Have you asked your contractor for their license?



- Roofs may have to be reengineered for load bearing.
- Have you performed an energy audit for your home?
- Have you looked carefully at your cost and financing terms?
- Have you invested in energy-efficient lighting and appliances?
- Have you asked about warranties and maintenance responsibilities?

In Conclusion

Solar — and other types of grid-interconnected home power— plus independent off-grid power generation will be an ever-increasing part of our power future. Done appropriately, this industry will grow steadily to the benefit of all.

To this end, Spring City is committed to helping anyone interested to get credible and correct education, along with a process that supports a balanced approach to increasing the amount of independent home-power generation, both grid-tied and off-grid.

For help with the process of education and getting questions answered, please feel free to call the City offices, 8 – 4 Monday through Thursday, (435) 462-2244. We'll answer your questions or direct you to someone who can.

We look forward to helping you make the correct decision for your particular situation that will also contribute to a bright future for all of us.

Sincerely,
Spring City Power Advisory Board

DISCLAIMER: *Spring City is not in the business of making specific recommendations about which company or contractor to use. We are not affiliated with any business organization selling or installing power-generation systems. We will do our best to answer questions, make general recommendations and correct misunderstandings. However, it is up to the individual homeowner to research the pros and cons, properly educate themselves, do their due diligence, and then make their own decision based on sound facts.*