



Lehigh County
Pennsylvania

OFFICE OF THE CONTROLLER

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Lehigh County
Pennsylvania

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ESSAY

CONCERNING

**Renewable Energy Credits & Power
Purchase Agreements**

04.21.2021

The opinions expressed are our own and the comments are not a result of an audit performed by the office of the controller under the accepted Government Auditing Standards (GAGAS).

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Lehigh County Controller

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EARTH DAY 2021

Lehigh County Government Center
17 S 7TH Street
Allentown PA, 18109

Dear Administration and Commissioners,

April 22nd marks Earth Day, the annual celebration of our planet and efforts to maintain and treasure its beauty. This year's Earth Day theme is "Restore Our Earth". The 51st Annual Celebration acknowledges that as the nation returns to normal, our response to climate change can be anything but normal.¹ The letter below details how Lehigh County can play a role in restoring our planet and generating new sources of energy to power our world.



¹ <https://www.earthday.org/>





*This image is the official image of Earth Day 2021 and in no way reflects an official endorsement of the Lehigh County Controller's recommendation.

My office has recently reviewed the electric bills of the County. We are currently using approximately 21,000,000 kWh's per year at a cost of approximately \$1.5M. Our electricity comes from a mixture of sources but is primarily based on fossil fuel energy. Using our purchasing power, we can reduce demand for fossil fuel energy and increase demand for clean/green energy.

There is universal agreement that climate change is an existential threat to our way of life and that its negative effects are already intensifying catastrophic weather events around the world, including more frequent and intense downpours and flash flooding here in the County. We cannot escape the threat, nor can we fail to act now to respond. In fact, the science is clear that in order to stop the worst impacts of climate change, we must transition away from fossil fuels to 100% clean energy.

This letter constitutes a recommendation of the Controller's Office for Lehigh County to enter into a Renewable Energy Power Purchase Agreement (PPA) to reduce the county's carbon footprint. Furthermore, it is the recommendation of the Controller that in the interim period of time, the county purchase renewable energy credits (REC) to ensure certainty about the source of the county's power supply. It is the Controller's belief that this two-pronged strategy accomplishes two distinct tasks. It supports and encourages renewable energy production in the short-term by purchasing RECs and enables renewable energy producers to gain access to guaranteed income.

This represents an immediate and definitive action the county can take to support sustainable energy and offset its carbon footprint. PPA's take a considerable amount of time to negotiate and construct, which means their environmental benefits take time to materialize.

During the period of time the county is purchasing REC's it should move in an expedient manner to sign a PPA. PPA's which have a longer operational timeframe reflect one of the strongest tangible actions the county can take to directly support renewable energy generation. A PPA benefits will be felt in the long-term as the county experiences both cost-savings and better budgetary predictability.





RENEWABLE ENERGY CREDITS

Renewable Energy Credits (REC) eliminate the uncertainty that arises from procuring power from the energy grid for consumers of electricity. Electric grids generate their sources of energy from a variety of systems ranging from wind to coal. Because of this, there is no way to know exactly where your energy comes from.

This makes the ethical consumption of cleaner energy more difficult to track for environmentally conscious consumers. A Renewable Energy Credit helps solve this problem. While we cannot identify where the electricity come out of our electrical socket comes from, we can make sure that we are paying for clean energy to be added to the grid rather than brown energy. If we purchase RECs from clean power producers, we increasing demand for clean energy. Although the County may not be directly supplied with clean sourced energy, if we purchase RECs from clean power producers the investment will result in increased consumption of clean sourced energy.

There is a cost to investment in clean energy. Based on Lehigh County's estimated energy use of approximately 21 million kWh's per year, the estimated cost production for annual use if RECs is \$40,000 which only represents approximately 3% of our annual spend.

It should be noted that over the past several years, the County of Lehigh has partnered with an energy broker to help reduce electricity costs. This has included a retail electricity agreement with Talen Energy for fixed generation and transmission fees. During our recent review of electricity bills, we identified three county locations that were not included in the retail electricity agreement with Talen. We have been informed that two of the locations have since been included in the agreement, taking advantage of the lower rates. The remaining location for which the county was paying electricity was leased 8/1/2020. The service for this location has since been stopped.

(See graphic on last page.)





POWER PURCHASE AGREEMENTS

PPA’s allow federal, state and municipal governments to undertake constructive and bold action to reduce their carbon footprint while providing climate leadership to the private sector. The benefits of a PPA are multifaceted. First, as the PPA merely obligates the governmental entity to purchase energy from the provider, the county assumes no up-front capital costs or operational requirements. A utility undertakes the risks with the promise of a contractual requirement to sell energy to the government.

Second, the PPA significantly reduces energy costs and creates long-term sustainability and predictability regarding the future costs. Finally, a PPA generates local job growth and investment by significantly expanding renewable energy capacity. These are high-paying, skilled jobs that provide a pathway to the middle class.

We recommend that Lehigh County enter into a PPA with a goal of transitioning to 100% clean, renewable energy. This investment in clean energy in our community will foster development, encourage the location or relocation of businesses here, increase the county’s reputation as a good steward of natural resources, and of course help protect our Earth.

In the accompanying pages, we present the data supporting this recommendation. We believe the information provided warrants the prompt attention of the Commission. Only with immediate and sustained action can we begin the long, hard fight to slow the progress of climate change, and to mitigate the damage it may inflict on Lehigh County residents.

CLIMATE CHANGE AND LEHIGH COUNTY

An Affordable Step Forward

The month of June 2019 was the hottest June in recorded history.² According to the National Oceanographic and Atmospheric Administration, July 2019 “was the warmest month on record for the globe.”³

² <https://www.ncei.noaa.gov/news/gl> CAB concludes that the School District improperly rejected the Charter School’s second application [bal-climate-201906](https://www.ncei.noaa.gov/news/global-climate-201906)

³ <https://www.ncei.noaa.gov/news/global-climate-201907>





The winter of 2019-2020 “was by far the warmest on record for Europe” according to the Copernicus Climate Change Service.⁴ And the Australian Bureau of Meteorology confirmed 2019 was the country’s “driest and hottest year on record since measurements began a century ago.”⁵

In 2018, California wildfires killed 103 people, including 6 firefighters, burned 1.9 million acres, and destroyed 19,000 homes and business. That single season’s wildfires caused damages and losses estimated in the hundreds of billions of dollars.⁶

And nearby Morgantown, PA, 20 homeowners suffered tornado damage in May 2019.⁷ In a year-end review, The Morning Call headline read, “The year of extreme weather, 2019 unleashed tornadoes, hail and damaging winds in the Lehigh Valley.”⁸

Growing Awareness

Climate change was once thought to be a distant threat, more theoretical than real. It is now a present danger and an unavoidable issue requiring the immediate attention of all responsible civic leaders. Climate change is here and it’s real.

Pennsylvania is no stranger to its effects, from longer and hotter summers, increases in the mosquito season and heavier rains that threaten us with flash floods and devastations, Pennsylvanians lives and their way of life are in danger. According to States at Risk, Philadelphia will have five times as many days where the heat index exceeds 105 degree in the summer from just 8 in 2000 to 40 by the year 2050.

⁴ <https://climate.copernicus.eu/boreal-winter-season-1920-was-far-warmest-winter-season-ever-recorded-europe-0>

⁵ <http://www.bom.gov.au/climate/current/annual/aus/>

⁶ Dr. Joel N. Myers, AccuWeather, July 8, 2019; <https://www.accuweather.com/en/weather-news/accuweather-predicts-2018-wildfires-will-cost-california-total-economic-losses-of-400-billion-2/432732>

⁷ The Patriot-News, May 29, 2019; <https://www.pennlive.com/news/2019/05/tornado-damages-20-properties-in-eastern-pennsylvania-photos.html>

⁸ The Morning Call, December 28, 2019; <https://www.mcall.com/news/weather/mc-nws-lehigh-valley-weather-year-in-review-20191227-lkku3cm6zdpndulmxdmcmca-story.html>





Summer droughts are expected to increase by 50% through 2050. Furthermore, rain storms in PA will soon get worse with heavy downpours increasing. Flooding won't just destroy property and potentially loss of life, it will produce sewage overflows.⁹

True, it's a global phenomenon. But the inevitable process of global climate change can be diminished with the concerted effort of all forward-looking people. It's no longer an option to do nothing. State, county, and municipal governments across the U.S. have adopted new procedures designed to reduce their emission of greenhouse gases. At the same time, financial resources are being directed to the development and support of clean, renewable energy sources in a national effort bring down the level of CO² still being generated in our communities.¹⁰

Government Action

The Environmental Protection Agency created the Green Power Partnership to encourage the voluntary use of green power and provide public recognition of members' commitment to fight climate change. In Pennsylvania, the Commonwealth Financing Authority provided \$12 million to construct energy-efficient schools and develop projects focused on generating clean energy.¹¹

Governor Wolf formally committed to the goal of reducing the Commonwealth's greenhouse gas emissions by 26% by 2025.¹² And this past October, the Governor signed Pennsylvania onto the Regional Greenhouse Gas Initiative, a multistate effort to cut carbon pollution from power plants in the Northeast and MidAtlantic states.¹³

⁹ <https://statesatrisk.org/pennsylvania/all>

¹⁰ US EPA, 2017; <https://19january2017snapshot.epa.gov/statelocalclimate/local-examples-climate-action.html>

¹¹ Pennsylvania Government website of Governor Tom Wolf; <https://www.governor.pa.gov/newsroom/governor-wolf-expands-clean-and-renewable-energy-through-12-million-in-state-funding/>

¹² Pennsylvania Government website of Governor Tom Wolf; <https://www.governor.pa.gov/newsroom/governor-wolf-takes-executive-action-to-combat-climate-change-carbon-emissions/>

¹³ Pennsylvania Government website of Governor Tom Wolf; <https://www.governor.pa.gov/newsroom/praise-for-gov-wolfs-action-to-combat-climate-crisis/>





Each community must decide what action it can take now to contribute to the collective fight against harmful climate change. As an administrative body overseeing the health and welfare of more than 368,000 people, the Lehigh County Commissioners demonstrated their commitment to the fight in December, 2019 by approving the ordinance implementing the C-PACE program enabling commercial property owners to access funds to purchase energy efficient equipment, clean power systems, and water saving fixtures.

The threat we face is great enough that we in Lehigh County can do more to reduce the county's carbon footprint. If funds were unlimited, we could subsidize the construction of local clean energy generating plants, new hydroelectric facilities, or solar and wind farms. And in time, those improvements can develop through private and public investment.

Right now, like many other communities, we can make sure that the vast amounts of energy we use to operate the county infrastructure is derived from clean, renewable sources, and at a very low cost. "The electricity sector is responsible for more than one-fourth of all of U.S. carbon emissions, ranking just behind transportation as the leading emissions source."¹⁴

Renewable Energy Certificates & Power Purchase Agreements in Action

Renewable energy demand is growing, but the industry is still relatively young and needs continued investment to maintain its momentum. Limited public funds can be committed to support the development and economic stability of this imperative technology through the purchase of Renewable Energy Certificates, or RECs.

A Renewable Energy Certificate is an "accepted (tradeable) legal instrument through which renewable energy generation and use claims are substantiated in the U.S. renewable energy market."¹⁵ It's the legal document, registered and traceable, that represents the owner's property rights to a certain amount of renewable energy generation.

¹⁴ Inside Climate News, Mar. 5, 2020; <https://insideclimatenews.org/news/04032020/inside-clean-energy-charts-2019-electricity-solar-wind-coal-use>

¹⁵ US EPA website, updated May 13, 2019; <https://www.epa.gov/greenpower/renewable-energy-certificates-recs#certificate>





It works like a title to identify the actual purchasers of clean energy. When electricity is provided through our local utilities, no one can determine how much of the energy delivered to your home or office was sourced from a renewable energy generator or from burning coal, or from some other high CO² emitting fuel.

Buying one REC is legally recognized, marketable proof that the owner of the REC subsidized the production of 1,000 KWh, or 1 MWh, of clean electricity. It attests to the fact that the buyer actually is responsible for the production of energy from a project that either generated new clean energy or reduced the greenhouse gases already in the atmosphere.

The money directed into the renewable energy industry via the purchase of RECs hastens the research and development of improved processes, and as the technology advances, the price of clean energy comes down.

Power Purchase Agreements, contribute further to the goal of removing uncertainty from energy production while fostering local energy production and job creation locally. A PPA recently signed by the Montgomery County Board of Commissioners would cost them \$24,000 annually or 1.4% county's electrical costs. The County will also realize \$700,000 in savings over 3 years.¹⁶

Benefits of REC Ownership

The benefits of buying RECs far outweigh the marginal cost they carry, especially now when they are so inexpensive. Between 2014 and 2016, the city of Worcester, MA, exceeded its 20% clean energy goal by purchasing enough RECs to cover 22% of its total municipal electrical consumption. The total cost was equal to less than one-quarter of one percent of the total municipal electrical costs.¹⁷ A leading financial advisory and asset management firm tracking the cost of energy publishes a Levelized Cost of Energy (LCOE) analysis. It concluded that, "U.S. renewable energy prices continued falling fast in 2019, with wind and solar hitting new lows, after renewables fell below the cost of coal in 2018."¹⁸

¹⁶ <https://www.montcopa.org/ArchiveCenter/ViewFile/Item/4830>

¹⁷ Worcester, MA Green Energy website, 2020; <http://www.worcesterenergy.org/leading-by-example/renewable-energy/renewable-energy-certificates>

¹⁸ Lazard, Levelized Cost of Energy and Levelized Cost of Storage 2019, Nov. 2019; <https://www.lazard.com/perspective/lcoe2019>





Value Investment

Buying RECs now is an investment in saving enormous sums of public funds in the future. Public health experts and an international study published in the Lancet, a peer-reviewed medical journal, concluded that climate change will mean “more people will be exposed to extreme weather events over the next century than previously thought— ‘a potentially catastrophic risk to human health’ that could undo 50 years of global health gains.”¹⁹

The climate related weather changes will cause power outages in extreme storms, crop failures threatening undernutrition, heat stroke among outdoor workers, like farmers and construction workers, and an increase in insect-borne disease due to warmer winters.²⁰

In its Winter 2020 report, the PennEnvironment Research & Policy Center showed that in 2018, Lehigh County suffered 99 days of dangerously high polluted air.²¹ More ominous is the Union of Concerned Scientists 2019 report, [Killer Heat in the United States](#).²² Among the data reported was the number of extreme heat days to expect by the middle and end of this century if little or nothing is done now to reduce greenhouse gas emissions. The data applying to Lehigh County is presented below in a table detailing the projected increase in the number of days with temperatures above 90°, 100°, and “off the chart” temperatures.

¹⁹National Geographic, 2020;

<https://www.nationalgeographic.com/climate-change/how-to-live-with-it/health.html>

²⁰U.S. Govt. Climate Assessment Report, 2018 (Executive Summary);

<https://nca2018.globalchange.gov/chapter/18/>

²¹ “Trouble in the Air,” Elizabeth Ridlington and Gideon Weissman, Frontier Group, Morgan Folger, Environment America Research & Policy Center;

https://pennenvironment.org/sites/environment/files/reports/PA_TroubleintheAir_print.pdf

²² Killer Heat in the United States; Union of Concerned Scientists, July 2019.

<https://www.ucsusa.org/resources/killer-heat-united-states-0>





| State | County | Days per year with a heat index above 90°F | | | | | |
|-------|---------------|---|-------------|-----------|--------------|-----------|--------------|
| | | Historical | Midcentury | | Late century | | Rapid action |
| | | | Slow action | No action | Slow action | No action | |
| PA | Lehigh County | 16 | 45 | 55 | 54 | 86 | 47 |
| State | County | Days per year with a heat index above 100°F | | | | | |
| | | Historical | Midcentury | | Late century | | Rapid action |
| | | | Slow action | No action | Slow action | No action | |
| PA | Lehigh County | 1 | 11 | 20 | 16 | 43 | 11 |
| State | County | Days per year with a heat index above 105°F | | | | | |
| | | Historical | Midcentury | | Late century | | Rapid action |
| | | | Slow action | No action | Slow action | No action | |
| PA | Lehigh County | 0 | 4 | 9 | 7 | 27 | 4 |
| State | County | Days per year with an off-the-charts heat index | | | | | |
| | | Historical | Midcentury | | Late century | | Rapid action |
| | | | Slow action | No action | Slow action | No action | |
| PA | Lehigh County | 0 | 0 | 0 | 0 | 3 | 0 |

Data Source: Union of Concerned Scientists, Report *Killer Heat in the United States*, July 2, 2019.²³

Climate Leadership

The costs of unchecked global warming will affect every community. Healthcare costs for those people whose health is compromised will rise due to heat related stress and worsening air quality. Increased heat and extreme weather will negatively impact food production, with more frequent drought conditions and by flooding rain events.

Purchasing REC’s and negotiating a PPA will allow Lehigh County to be a leader on climate change. Forward looking businesses are shifting investment to renewable energy sources and away from greenhouse gas producing facilities. Lehigh County will claim a leadership position in climate responsibility. Corporate investment and jobs are attracted to regions where political leaders have the foresight to anticipate future costs and take immediate action to mitigate those costs.

²³ endnote 19 (chart constructed from data in this spreadsheet tabs 90°F, 100°F, 105°F, and Off the Chart) see URL





Lehigh Valley is already home to nearly 5,000 clean energy jobs.²⁴ Purchasing renewable energy to claim ownership of climate leadership should act as a magnet to other private investment and add to the county's national reputation.

In 2014, 2017, 2018, and again in 2019, the Lehigh Valley was recognized by Site Selection Magazine as the one of the top 5 best performing regions of its size for economic development in the country and the best performing region in the entire Northeastern United States.²⁵

Now is the time to take prudent measures to promote the use of clean energy in our community. Leading by example will demonstrate to Lehigh residents that we are working to reduce the threat to their future by investing in renewable energy technology.

We are called upon now to honor the promise of Article I, section 27 of the Pennsylvania Constitution:

"The people have a right to clean air, pure water, and to the preservation of the natural, scenic, historic and esthetic values of the environment. Pennsylvania's public natural resources are the common property of all the people, including generations yet to come. As trustee of these resources, the Commonwealth shall conserve and maintain them for the benefit of all the people."

²⁴ Morning Call, Aug. 29, 2018; <https://www.mcall.com/business/mc-biz-renewable-energy-report-20190822-giwa7p6h4bhntaesg6ptrcvjfa-story.html>

²⁵ Colin McEvoy, Lehigh Valley Economic Development Corp., March 5, 2019; <https://lehighvalley.org/lehigh-valley-cracks-top-five-in-u-s-for-economic-growth-in-2018/>





Renewable Energy Credits: How They Work

