



CDFS-DEG3-13

Distributed Energy Generation Series

A Business Guide for Investing in On-Site Energy Generation

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Introduction

A growing number of businesses are adopting on-site distributive energy resources to generate their own electricity. “Distributed energy resources—also called distributed generation, distributed energy, and distributed power systems—are small, modular, decentralized, grid-connected or off-grid energy systems located in or near the place where energy is used” (U.S. Department of Energy, 2012). For the purpose of this fact sheet series we will refer to distributed energy resources as distributed energy generation (DEG) systems. On-site DEG systems include a wide range of technologies such as anaerobic digesters, wind turbines, solar systems, fuel cells, combined heat power, and natural gas systems. As the technology for these resources becomes more available, efficient, and affordable, the use of on-site DEG is expanding. Expansion is being incentivized by states and utilities through net metering policies that allow consumers to produce only the energy they need, and selling the excess back to the utility. The purpose of this fact sheet is to assist businesses with the information they need to know to invest in and benefit from on-site DEG systems.

Critical Steps in Planning and Implementation

On-site DEG is not a new concept. In fact, “there are about 12 million distributed generation units installed

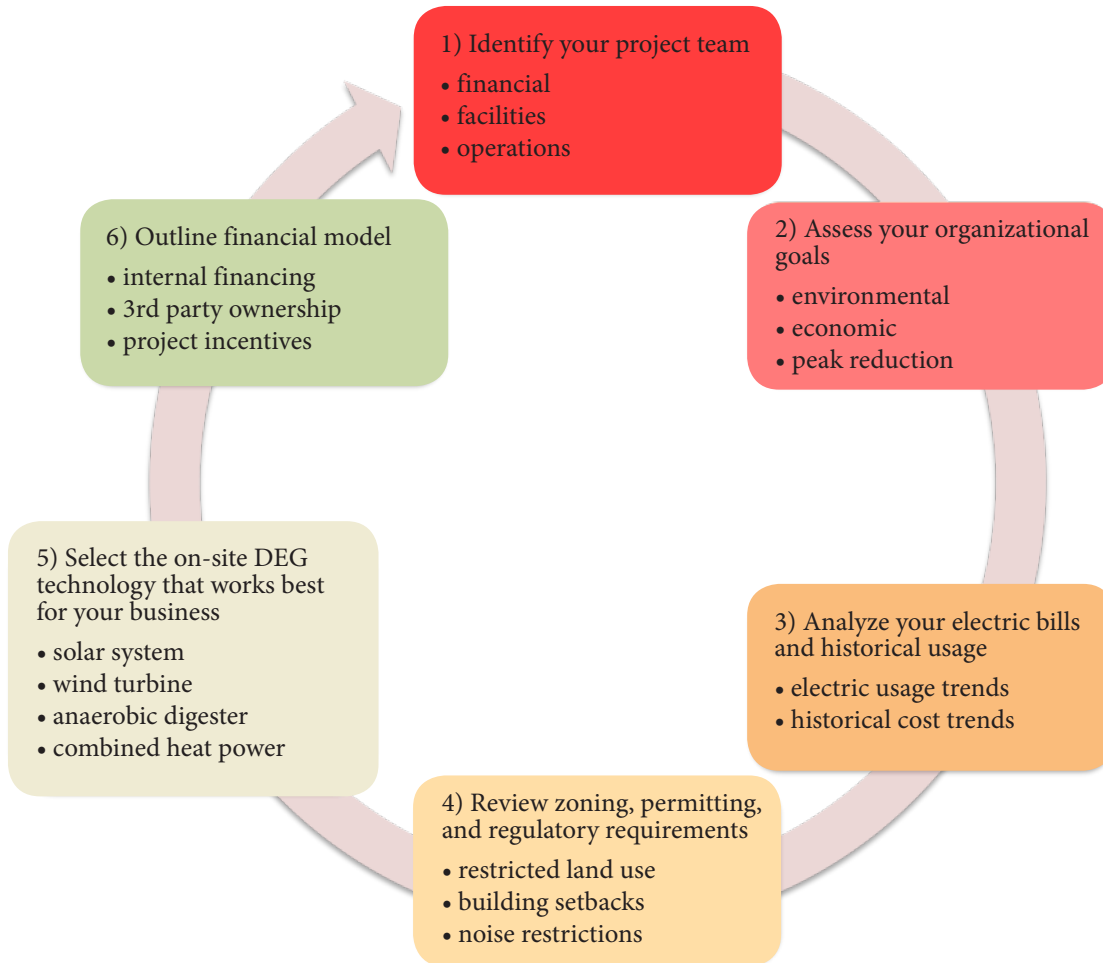
across the country, with a total capacity of about 200 GW” (U.S. Department of Energy, 2007). While overall cost and economics will vary on a case-by-case scenario, on-site DEG projects offer a variety of potential benefits such as increased reliability, reduction of peak power demand, improvements in power quality, reduced emissions, and decreased price volatility. There are several critical steps in the planning and implementation phase, which help quantify the project feasibility and analyze the potential impacts.

Assessing Your Goals

Does your business plan support investment in a long-term, on-site DEG system? For instance, will installing a system solve existing problems your business is having, or address long-term, energy-related concerns? Assessing your goals is an essential first step for any business considering an investment of this size and scope. Listing the considerations, both pro and con, will help guide in the decision-making process. Below is a list of goals cited by many businesses during the planning stages.

- Reduce long-term energy costs
- Increase energy reliability
- Minimize environmental impact
- Stabilize energy prices
- Support our business philosophy

Figure 1. Critical Planning Steps



Building Your Team

In an ever-evolving business environment, organizations have a multitude of capital investment options to consider. The ability to secure financing approval for a project often depends on the ability to structure an effective multidisciplinary team to develop and evaluate the project proposal. Potential team members you may want to consider including on the project team are the facility/business manager, financial controller, operations manager, maintenance manager, utility provider, representative from local government planning/zoning department, and renewable energy developers/contractors.

Analyzing Your Bills and Usage

A vital step in properly sizing your system and meeting your goals for on-site DEG is to analyze and understand your electric usage. DEG systems in Ohio should be sized to offset, not exceed your facility's electricity needs. To get started, collect historical data

and compare your business's annual electric consumption to previous years. This will help to identify the facility's hours of peak demand, off-peak hours, and year over year total usage trends. In order to make an informed economic comparison you will also want to track the historical trend of your electricity rates. This will provide customized historical information on energy usage for your business to compare with electric cost projected by the U.S. Energy Information Administration. This data will provide accurate modeling of energy cost to conduct an economic cost/benefit analysis for a project.

Permitting and Regulatory Considerations

Researching state and local regulations is an essential step in the project planning process. Before committing any financial resources, verify that your project complies with local zoning ordinances, building codes, and property easements. In addition to determining eligibility with state and local regulations, you will need

to contact your utility provider to review your project proposal and discuss interconnection requirements. A DEG system that is going to be connected with the utility’s local distribution system must comply with the interconnection standards applicable to that system. In Ohio, “the interconnection review process varies based on the amount of electricity you intend to produce and the location of your equipment on the electric utility’s system” (Public Utilities Commission of Ohio, 2011). The state energy office, local community planning director, utility provider, and project developer are good resources to assist you in identifying and understanding the permitting and regulatory considerations for a project.

Selecting an On-Site Generation Technology

There are a wide variety of technologies to consider for an on-site DEG system. For example, a business may consider technologies such as anaerobic digesters, wind turbines, solar power, fuel cells, combined heat power, and natural gas systems. In order to select the proper on-site DEG system for your business, you will need to examine a number of factors including:

- Energy resource availability
- Financial feasibility and costs
- Desired system size
- Available space needed to support development

- Zoning and setback requirements
- Permitting and regulations
- Ongoing maintenance and operation cost
- Before installing a system, you will want to inspect the age, warranty, and engineered specs for the facility’s supporting infrastructure, i.e. rooftop, HVAC, etc.

Project Financing Considerations

In addition to private capital, financing is available in the form of grants, loans, and incentives through regional, state, and federal agencies including the Ohio Development Services Agency, Ohio Treasurers Office, Port Authorities, and the U.S. Departments of Energy, Agriculture, and Small Business Administration. The agencies provide a variety of financing options including direct and guaranteed loan programs, grants, and tax credits for investment in on-site DEG systems. Businesses who are considering this type of fixed asset investment, particularly if they anticipate creating or retaining jobs as a result, should investigate options for financing before proceeding. The table below lists several financing programs available for businesses investing in DEG projects in Ohio.

The Federal Production Tax Credit (PTC) and Investment Tax Credit (ITC) are incentives for development and deployment of renewable energy

Table 1. Financing Programs

Program	Agency	Rate/Term/%	Amount	Site Reference
Energy Loan Fund	Ohio DSA (Development Services Agency)	Case by case and useful life	80% of project or up to \$1M	http://www.development.ohio.gov/bs/bs_energyloanfund.htm
Reenergize Ohio	State Treasurer of Ohio	3% interest rate reduction	Up to \$550,000	http://www.tos.ohio.gov/ReEnergizeOhio
Loan Guarantee Program	Department of Energy	30 years and 90% of useful life	Focuses on projects over \$25M	http://www.lgprogram.energy.gov
Loan Program	Department of Agriculture	Varies	Up to \$25M	http://www.rurdev.usda.gov/rbs/busp/bprogs.htm
504 Loan Program	Small Business Administration	Rate and term varies, up to 40%	\$5.5M for energy project	http://www.sba.gov/content/cdc504-loan-program
REAP Grants	Department of Agriculture	Varies, 25% of total project	Up to \$500,000	http://www.rurdev.usda.gov/rbs/busp/9006grant.htm
Better Buildings NWO	Toledo Port Authority	Term up to 15 years	\$25,000–\$5M	http://www.toledoportauthority.org/en-us/programs/betterbuildingsnwo/howitworks.aspx

technologies. The PTC was established as a result of the Energy Policy Act of 1992. With a 2.3 cent per kilowatt/hour income tax credit, this incentive has been a major financial driver for the development of new energy systems, from distributed to utility scale generation projects. Projects that are under construction prior to December 31, 2013, are currently eligible for the incentive. The Investment Tax Credit (ITC) provides a 30% credit toward the cost of development of eligible renewable energy projects, with no maximum limit. The credit takes effect once the energy system is placed into service and is available until the credit expires. The federal tax code also allows for the accelerated depreciation of eligible energy projects. This incentive allows businesses to front-load tax deductions for fixed asset investments in the early years of a project. In addition, a 50% depreciation bonus can be applied in the first year of the asset. For instance, if the life of a project is 20 years, the facility can be expensed over a shorter term of 5–6 years. Depreciation can also create a net loss, which the business can carry over for up to 20 years. The net profit realized by accelerated depreciation helps to incentivize construction of new on-site DEG projects. Tax incentive programs are also summarized in Table 2 below.

Another key financial tool to advance projects is a system of credits known as Renewable Energy Credits (RECs), which validate and track the amount of renewable energy generated by a qualifying system in a given year. One REC is equal to one-megawatt hour of power generated. Utility companies are able to buy, sell, or trade RECs in order to meet compliance requirements (Ohio Revised Code 4928.65, 2009). The Public Utility Commission of Ohio (PUCO) must approve energy

systems and the business needs an interconnection agreement with the utility to qualify.

For more information on financial incentives, the Database to State Incentives for Renewables and Efficiency (DSIRE) (www.dsireusa.org) offers a list of financial options and incentives searchable by state. The information is updated regularly to include new programs or changes to existing programs.

Case Study Example: Campbell Soup Company

Campbell Soup Company established a primary environmental sustainability goal to reduce the company’s environmental footprint by 50% by 2020. A supporting strategy to accomplish this goal includes sourcing 40% of their energy from alternative and renewable energy sources (Campbell Soup Company 2012 Corporate Responsibility Report, 2012). As an outcome from this initiative, in February 2011 the Campbell Soup Company entered into a third-party power purchase agreement (PPA) and land-lease agreement to provide renewable solar energy to the company’s largest plant in Napoleon, Ohio. Campbell will lease 60 acres of land to BNB Napoleon Solar LLC to design, build, own, and maintain a 9.8-megawatt (MW) solar project consisting of over 24,000 photovoltaic solar panels.

Through the PPA, Campbell Soup will buy 100% of the electricity generated by the system for the next 20 years. The Solar Renewable Energy Credits generated from the project will be sold by BNB to FirstEnergy Solutions (Campbell Soup Company, 2011). The system became operational in December 2011 and is projected to eliminate 250,000 metric tons of CO₂ greenhouse gas emissions in the region and generate

Table 2. Tax Incentive Programs

Program	Description	Eligibility
Production Tax Credit (PTC)	Credit that reduces federal income taxes for qualifying energy projects based on electrical output.	Taxpayers
Investment Tax Credit (ITC)	Credit that reduces federal income taxes for renewable energy projects based on capital investment.	Taxpayers
Advanced Energy Manufacturing Tax Credit (MTC)	Credit that reduces federal income taxes for up to 30% of investment in a clean energy or energy efficiency manufacturing facility project. Projects must be certified.	Taxpayers
Modified Accelerated Capital-Recovery System (MACRs)	Five-year accelerated depreciation schedule, which is allowed for all ITC-eligible technologies. The schedule can be expanded to seven years for certain biomass projects.	Taxpayers

approximately 15% of the electricity needed to run the Napoleon operations. Over the course of the PPA, Campbell's estimates they could save up to \$4 million based on U.S. Department of Energy projections.

Summary

Not every business or facility is well suited for the implementation of an on-site DEG system. Barriers including site size, return on investment timeline, land use requirements, or zoning regulations can prevent many businesses from even entertaining the thought. But, for others, planning, designing, building, and operating a system provides a new source of energy that can bring many benefits to the operation and improve the bottom line.

Definitions

Distributed generation: Term commonly used to indicate non-utility sources of electricity, including facilities for self-generation located on-site.

Kilowatt (kW): One thousand watts.

Megawatt (MW): One megawatt is equal to one thousand kilowatts or 1 million watts.

Net metering: Policy implemented by some states and utilities to ensure that any electricity produced by an on-site energy system can be sent back into the utility system.

Public Utilities Commission of Ohio (PUCO): State agency that monitors the activities of utility and transportation companies, scrutinizing rate and service matters for consumer protection.

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