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EVERY COMMUNITY SHOULD GET “CLEAN”

By Craig Lewis

A Clean Local Energy Accessible Now (CLEAN) program is a national, state, or local program that promotes the growth of a strong clean energy economy by reducing the risks, transaction costs, and complexities involved in selling renewable energy from under-used spaces and resources in our communities, such as rooftops, wastewater treatment plants, and capped landfills.

CLEAN programs, also known as feed-in tariffs, have emerged as the premier policy mechanism for deploying vast amounts of cost effective renewable energy while delivering economic benefits to the areas that adopt them. CLEAN programs are a vital tool for any jurisdiction that seeks economic sensibility, environmental sustainability, and energy security. Further, CLEAN programs are the “killer application” for driving intelligent grid solutions like demand response, energy storage, and microgrids, which are increasingly needed for balancing local supply and demand of electricity with higher penetrations of clean local energy.

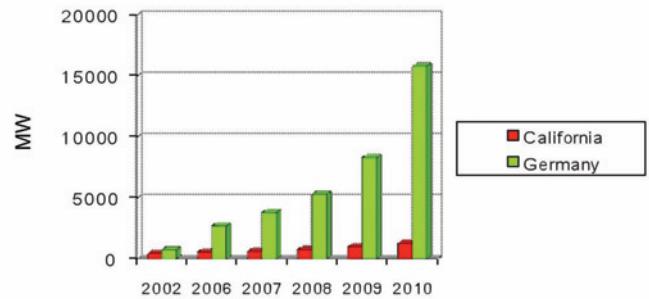
A PROVEN POLICY AROUND THE GLOBE

Worldwide, CLEAN programs are unmatched in their ability to bring massive amounts of clean energy online in a timely manner and have been introduced in more than 50 countries. The US Department of Energy’s National Renewable Energy Laboratory (NREL) reports that CLEAN programs are responsible for 45% of all wind energy and 75% of all solar photovoltaic (PV) capacity installed in the world before 2008. The Center for American Progress has found that CLEAN programs have helped to bring more renewable electricity into the marketplace than any other policy, by far. There are numerous examples of countries and other jurisdictions that have unleashed the growth of renewables with CLEAN programs, and these are responsible for increasing percentages of deployed renewables.

Germany has the most comprehensive CLEAN program to date, driving unparalleled levels of renewable energy deployments. Despite having slightly less land area than California, and solar resources roughly equivalent to those of Alaska, Germany was able to add 28 times more solar than California in 2010 (Figure 1). According to the German Biogas Association, Germany’s biogas industry also grew exponentially with an estimated 3,000+ operational, farm-located anaerobic digesters by the end of 2010 in comparison to the roughly 160 in the US. Neither of these industries could have had such tremendous growth without Germany’s robust CLEAN program.

The CLEAN program in Ontario, Canada, which includes differentiated pricing for biomass, biogas, landfill gas, wind, solar PV, and waterpower, is a key part of the province’s ambitious strategy to replace 100% of its coal power with renewables by 2015. As evidence that their CLEAN program is working, Ontario’s total installed solar PV capacity grew from less than 2 MW in 2008 to roughly 168 MW in 2010, according to the Interstate Renewable Energy Council (IREC).

China has aggressively moved forward with CLEAN programs. In 2009, the country instituted a wind-only CLEAN program, which



•In 2010, Germany added **28.5 Times** more capacity than California did.

•Overall, Germany has **16.5 Times** more capacity than California does

Figure 1 – Solar markets: Germany vs California

helped propel it to the number one wind market in the world. And in August last year, China announced the addition of a solar CLEAN program from which they expected to bring online between 1.5 to 2 GW of solar PV by the end of 2011.

In the US, CLEAN programs are beginning to catch on. The two most established programs are in Vermont and Gainesville, Florida; with multiple jurisdictions that have followed and increasing numbers that are coming.

In May 2009, Vermont enacted the first statewide CLEAN program in the US. The program had an initial goal for the deployment of 50 MW of new renewable energy generation. Demand for the CLEAN program exceeded the supply with more than 172 MW of projects submitted within the first eight hours of the program going live. The response is a clear indication of the pent-up demand for deploying renewables, and the opportunity that awaits the jurisdictions that remove the existing barriers.

The CLEAN program enacted in Gainesville, Florida in 2009 has also experienced phenomenal success. Gainesville saw a 2,000% growth in its cumulative solar PV capacity within a 2.5-year period. Gainesville Regional Utilities (GRU) granted all of its initial annual 4 MW allocation in the first week of the program’s existence, and within five months, the program was fully subscribed for the next seven years. Beyond filling all 32 MW of its CLEAN allocations through 2016, there is a long waitlist, which indicates strong interest for an expanded CLEAN program.

HOW CLEAN PROGRAMS WORK

CLEAN programs work by ensuring rapid development of the wholesale distributed generation (WDG) market segment. WDG is defined as 20 MW and smaller renewable energy projects that are interconnected to the distribution grid, not the transmission grid. WDG projects can fit on a relatively small amount of land while producing a substantial amount of power. For instance, a 20 MW solar project fits on about 100 acres while meeting the peak load of about 20,000 homes. And, with WDG, the energy generated from renewables on spaces such as rooftops can be maximized rather than being limited to onsite loads. Hence, WDG can turn previously ineligible properties, such as non-owner occupied and split-metered commercial buildings, into productive places for

maximizing clean local energy and yield new sources of revenue for property owners.

WHY CLEAN PROGRAMS WORK

The three major components of a CLEAN program include a standard guaranteed contract between the utility and a renewable energy facility owner; predefined, fixed rates for a long duration; and predictable, streamlined access to the utility's distribution grid. Together, these elements of a CLEAN program create a stable market for local renewable energy projects by removing the three biggest barriers to WDG project development: procurement, interconnection, and financing.

The high risks and transaction costs of procurement (i.e. the process of securing a contract to sell energy to the local utility) is the top barrier that WDG projects typically face. By standardizing contract terms and rates, CLEAN programs dramatically reduce the risks and transaction costs involved in the procurement process.

Gaining access to the local utility's distribution grid is the second major barrier for WDG projects. Grid interconnection processes are generally opaque, expensive, and unpredictable. By making the process more transparent and streamlined, CLEAN programs pave the way for a smooth transition to greater reliance on clean local energy.

Attracting financing is the third most significant barrier to WDG because of the complexity, risks, and transaction costs associated with existing procurement and interconnection processes. By streamlining procedures, increasing procedural transparency, reducing transaction costs, and providing predefined and fixed rates, CLEAN programs make WDG projects attractive to a larger pool of potential lenders and investors, including large corporations and institutional investors. An important element of WDG is that the energy is purchased by utilities, which means that CLEAN programs facilitate projects that have high creditworthiness. This design feature underscores the low risk nature of CLEAN programs and helps to explain their tremendous success in attracting private investment.

Additionally, what is truly remarkable about CLEAN programs is the speed with which any jurisdiction can plan and execute a program. When the Sacramento Municipal Utility District (SMUD) decided in 2009 to establish a CLEAN program, it only took a year and a half from the initial thought to the formal launch. Gainesville was even faster and had an operational program within 10 months of deciding to pursue a CLEAN Program.

ECONOMIC SENSIBILITY BEHIND ENACTING CLEAN PROGRAMS

CLEAN programs create jobs. According to a Deutsche Bank Group Climate Change Advisors report, renewable energy jobs in Germany jumped from 160,000 in 2004 to 340,000 in 2009, largely due to the country's robust CLEAN program. In Gainesville, approximately 260 new jobs have been linked directly to its program. One local Gainesville renewable energy developer estimated that in 2011 alone, his firm paid at least \$1 million to local contractors due to the CLEAN program there. And, looking at potential new CLEAN programs, a University of California-Berkeley study concluded that a CLEAN California program would create three times more jobs than the state's historic approach for meeting its renewable energy goals, which relies on large scale renewables that have major costs and risks associated with siting in pristine environments and building expensive transmission lines.

Private investment happens more efficiently under CLEAN programs. Deutsche Bank Group Climate Change Advisors credits CLEAN programs for providing transparency, longevity and certainty in the renewable energy marketplace, which is key to

securing crucial project financing at reasonable rates. Community members and investors can easily calculate whether a renewable energy project is worth pursuing under a CLEAN program, removing the mystery and hazards of participating in the clean energy marketplace. In California alone, the UC Berkeley study mentioned above concluded that a CLEAN program would stimulate an additional \$50 billion in private investment beyond an approach that relies on large scale renewables.

An important feature of CLEAN programs is that the economic benefits can be delivered while ensuring a favourable experience for ratepayers. According to the Deutsche Bank Group Climate Change Advisors report, "The German Feed-in Tariff for PV: Managing Volume Success with Price Response," German ratepayers actually save money because of their CLEAN program. In the US, Gainesville ratepayers experienced a 2,000% growth in solar deployments with a ratepayer impact of less than 1%. The expected ratepayer impact for the soon-to-be operational Fort Collins, Colorado CLEAN program is less than 1%, while the program will increase the amount of solar in the locality by a factor of 40 in just two years. Although a CLEAN program may result in a small initial rate increase, depending on the pricing relative to avoided costs, policymakers can cap any ratepayer impact in the program design.

CLEAN programs also help electricity ratepayers avoid the costs of long distance transmission of energy. Developing a new high voltage transmission line to deliver electricity from a large scale renewable power project to consumers often costs billions of dollars. Additionally, transmitting energy across long distances is very inefficient and results in significant energy loss. For example, transmission line losses range between 7.5% and 14% for California and are around 8% for the City of New York. CLEAN programs take advantage of existing distribution grid capacity and drive opportunities to make cost effective investments in the distribution grid, while reducing demand for new transmission infrastructure.

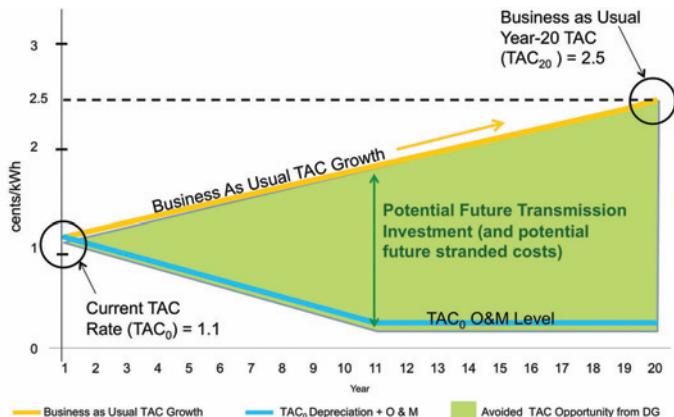


Figure 2 – Transmission access charge opportunity with CLEAN programs (Source: Clean Coalition 2011)

It should be noted that local utilities pay a substantial fee for receiving energy from the transmission grid. The utility for the City of Palo Alto, California calculates that transmission access charges (TACs) and other cost factors associated with transmission currently add roughly 1.5 cents/kWh. If California continues to build transmission, then these costs are forecast to increase significantly even though much of the infrastructure could become obsolete by the combination of clean local energy and intelligent grid solutions. Hence, transmission represents a substantial cost component of any energy generation that is interconnected to the transmission grid. Of course, the transmission-related costs are entirely avoided when energy generation is interconnected to the distribution grid for local use.

CLEAN programs also have the ability to drive state and local tax revenue through significant increases in economic activity associated with vast deployments of clean local energy. Under

the previously referenced UC Berkeley study, a CLEAN program for California would increase direct state revenues by more than \$2 billion, as compared to fulfilling the remaining portion of the 33% Renewable Portfolio Standard (RPS) goal with large scale renewables.

Another feature of CLEAN programs is their ability to allow communities to directly benefit from renewable energy development by keeping it local. In addition to the tremendous job creation potential of CLEAN programs, the adoption of this policy tool also creates new sources of revenue for local property owners and community members. CLEAN programs open the field, giving community members the opportunity to invest in renewable energy without exposure to the high risks, transaction costs, and complexity that they would otherwise face. With CLEAN programs, property owners can build renewable energy projects in a predictable fashion, which facilitates far broader participation than any other approach.

ENVIRONMENTAL SUSTAINABILITY OF CLEAN PROGRAMS

CLEAN programs lead to more environmentally friendly renewable energy development. Since CLEAN projects can be integrated into built environments like rooftops and deployed on already disturbed lands close to load centres, they avoid the environmental impacts of deploying projects and building transmission infrastructure on pristine and sensitive lands.

The divisive issues associated with the siting of large scale renewable power projects and related transmission lines are also avoided when using a CLEAN program to meet environmental and economic goals. The siting of new large scale renewable power plants and expansions of transmission infrastructure often divides communities with many parties fervently opposed to the disruption of sensitive ecosystems and the erection of unsightly transmission towers, lines, and other infrastructure. In contrast, CLEAN projects take advantage of underused urban spaces, and blighted or disturbed lands.

CLEAN programs are also flexible and can be designed to match available local renewable energy resources of a jurisdiction. CLEAN programs can be adopted for any type of renewable energy technology and may include energy from solar PV panels or biogas from dairy farms, landfills, and sewage facilities, as well as energy produced from wind, geothermal, and small-scale hydro projects.

While every community has its own set of renewable resources, studies have shown that most states in the US could get at least 20% of its electricity from solar PV alone. The only element preventing most communities from unleashing clean local energy is the lack of a policy mechanism that allows community members to take advantage of their local renewable energy resources.

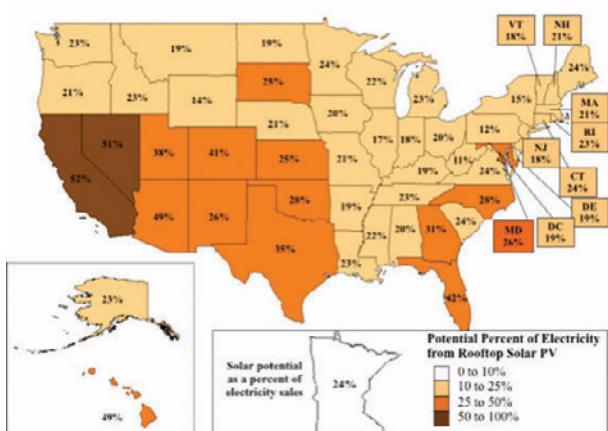


Figure 3 – Potential for rooftop solar PV in US (Source: Institute for Local Self-Reliance 2011)

Finally, a robust CLEAN program will rapidly increase local renewable energy project installations, which will reduce many communities' reliance on fossil fuel power plants, ultimately resulting in significant air quality improvement.

ENERGY SECURITY WITH CLEAN PROGRAMS

CLEAN programs encourage the development of an energy infrastructure that is diversified and not entirely reliant on vulnerable transmission lines and large scale power plants. Energy diversification keeps our communities safer in the event of a blackout, whether caused by natural disaster, terrorist attack, or simply a benign issue. High profile grid failures such as the August 14, 2003 Northeast blackout (caused by the failure of a single high voltage transmission line) or the recent San Diego blackout that affected more than five million people, could have been mitigated if these regions had high penetrations of clean local energy. CLEAN programs result in vast amounts of WDG, which when combined with intelligent grid solutions, delivers these vital security benefits.

Jim Woolsey, the former Director of the US Central Intelligence Agency, asserts that our transmission grid vulnerability is a national security issue that can be addressed with CLEAN programs. Terrorist attacks at a few isolated physical points in the transmission grid could compromise the nation's water, sewage, phone, transportation and medical systems – essentially most of our basic economic functions, because they all depend on electricity. Woolsey has concluded that CLEAN programs can make our electricity grid more resilient by facilitating the formation of microgrids that can provide essential services even during long term emergencies.

A SYMBIOTIC RELATIONSHIP: CLEAN PROGRAMS AND THE INTELLIGENT GRID

Currently, most local grid systems can handle increased amounts of distributed generation without any integrity issues. According to a study commissioned by the California Energy Commission, despite the remarkable increase in local renewable energy generation in Germany and Spain, neither country has required any major changes to their electrical grids, which have similar attributes to electrical grids in the US. However, once clean local energy projects account for a significant portion of generated electricity, integration with intelligent grid solutions will be a natural evolution. CLEAN programs and intelligent grid solutions are interdependent, as local balancing of supply and demand of energy are fundamental to the transformation of the energy future.

SUMMARY

CLEAN programs are the most effective policy mechanism available for any jurisdiction that wants to create significant growth in local renewable energy development and enjoy the economic benefits that result. CLEAN programs drive many additional benefits, including the need for intelligent grid solutions.

Together CLEAN programs and intelligent grid solutions will transition the world to a smart energy future. The greatest economic rewards will go to the jurisdictions that move first. [MI](#)



ABOUT THE AUTHOR:

Craig Lewis is Founder and Executive Director of the Clean Coalition and has extensive experience in industries that have high relevance to the technical, financial, and political issues associated with renewable energy. Prior roles include executive positions in the solar, telecommunications, and banking industries. Additional experience includes successful renewable energy deployments and key positions on political campaigns.

ABOUT THE ORGANIZATION:

The Clean Coalition is a non-profit organization whose mission is to accelerate the transition to cost effective clean energy across the US. The Coalition has developed a Local CLEAN Program Guide, which is designed to help communities and local utilities evaluate, design and enact CLEAN programs based on global best practices and the expertise developed through the Coalition's work designing and advocating for local CLEAN programs throughout the US. www.clean-coalition.org