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Model Municipal Ordinance Project Designed to Facilitate Wind and Solar Projects and Green Buildings

By Michael B. Gerrard and Danielle Sugarman

Soaring oil prices and the reality of climate change have underscored the need to reduce U.S. fossil fuel dependence by improving energy efficiency and by developing and expanding renewable sources of energy. The International Energy Agency declared in 2010 that "[i]ncreasing energy efficiency, much of which can be achieved through low-cost options, offers the greatest potential for reducing CO₂ emissions over the period to 2050."¹ Furthermore, increasing our reliance on renewable resources such as wind and solar energy is not only a prudent measure in helping America to improve its energy security, but is a necessary component of a basket of measures that must be employed in order to limit atmospheric CO₂ to a concentration that would avert the most damaging climate change. Presently, wind and solar energy account for only around one percent of the U.S. electricity supply.² Yet the Department of Energy projects that as much as twenty percent of America's electric power could be generated from wind energy alone by the year 2030.³

With the pressing need for action and with comprehensive climate legislation stalled at the federal level, local governments are playing an increasingly important role in pursuing energy efficiency and renewable energy alternatives. Municipalities not only account for a large portion of our national energy consumption, but control many aspects of local energy efficiency standards and zoning laws which promote or inhibit the installation of renewable energy resources.

These factors have not been lost on local officials. The last several years have seen a proliferation of municipal ordinances that address energy efficiency through green building practices. Yet, these ordinances vary widely in their design, content and coverage, and in the quality of their drafting. Similarly, municipal laws regulating wind turbine and solar panel installation vary widely among cities, towns and villages, with some jurisdictions offering strong protection for renewable energy generation, others enacting unnecessarily restrictive provisions, and most having no provisions at all. This patchwork of laws can complicate the work of architects, engineers and lawyers who must try to conform their clients' projects to local requirements. In this way, many opportunities to promote energy independence and to combat climate change are lost.

In an effort to address these problems, Columbia Law School's Center for Climate Change Law (CCCL) has undertaken a municipal ordinance project that seeks to address local siting challenges faced in the area of green buildings, commercial wind and residential solar energy

generation. The goal of the project is to create "best practices" for municipal ordinances that avoid the drafting problems and legal pitfalls that often pervade other ordinances. These model ordinances were derived from the best aspects of existing municipal ordinances. While they were designed with New York municipalities in mind, they offer a framework that can be easily modified by any local government to fit its particular needs.

CCCL has already released a model green building ordinance, which is currently being considered for adoption by a number of New York municipalities. A commercial wind siting ordinance is currently open for comment and will soon be circulated in revised form. Finally, a model residential solar ordinance will be released in the coming weeks for an initial comment period. The design and function of each ordinance are laid out below.

In drafting each ordinance, CCCL first compiled as many existing ordinances and policies in the relevant areas as possible and posted them online. The provisions were then analyzed to find their best features and compiled into a cohesive model ordinance. Draft versions were next posted online for comment by interested parties and ultimately revised into a final model. Each of the published ordinances contain detailed commentaries on their features, the rationale behind the choices they embody, the associated legal issues, as well as optional add-ons that municipalities may adopt to make their ordinances more widely encompassing.

Model Green Building Ordinance

In developing the Model Green Building Ordinance, CCCL looked to what has emerged as the nation's leading system of green building standards, the Leadership in Energy and Environmental Design (LEED) rating system of the non-profit U.S. Green Building Council (USGBC). LEED is a points-based system rather than a prescriptive standard. Different building or site features such as high energy efficiency, water conservation and material selection entitle a project to LEED points. If enough LEED points are accumulated, the building can receive a level of LEED certification ranging progressively from plain vanilla (certified) to silver, gold and platinum. The CCCL model ordinance starts with the LEED NC-3.0 standard, which is the latest standard for new constructions and major modifications. Covered buildings must meet the LEED silver level (the level CCCL found to be most often applied by existing green building ordinances). To achieve LEED silver, buildings must attain half of all possible LEED points. The ordinance provides for an option

which would require that a certain minimum number of points be obtained from energy efficiency measures. Due to the ever progressing nature of green building standards, the model ordinance provides that a municipality may take administrative action (without requiring a new vote by its city council or other governing body) to move to a different green building standard if that new standard meets certain criteria specified in the ordinance.

The LEED silver requirement would apply to new construction of municipal buildings, commercial buildings, and high-rise multifamily residential buildings that are at least 5,000 square feet in size. It would also apply to "major modifications" of those buildings, defined as rehabilitation work in at least two major building systems, construction work affecting at least half of the building's floor area, or construction increasing the square footage of the building by at least half.

As LEED is not well suited for smaller buildings, the model ordinance instead requires an adequate rating under the Energy Star Homes Rating System for all new construction of one- and two-family dwellings and low-rise multifamily residential buildings. Energy Star Homes was developed by the U.S. Environmental Protection Agency and the U.S. Department of Energy. It prescribes a set of energy efficiency guidelines.

While the USGBC certifies buildings under its standards, this has at times led to long delays. As such, the CCCL model ordinance does not require formal USGBC certification, but rather requires that, in order to obtain a building permit, the applicant must demonstrate that the building is designed to achieve the 50 LEED points required for LEED silver certification. Thus, after completion, a building would receive a certificate of occupancy only after it was determined to have achieved these points. If during construction, certain planned LEED points cannot be achieved leaving the building short, a temporary certificate of occupancy may be available until those points are achieved or appropriate mitigation measures are taken.

Under the CCCL green buildings ordinance, determinations of compliance with the LEED standards, Energy Star ratings, and other requirements would be made by a Green Buildings Compliance Official. This Official would be designated by the municipality and will often, but not always be, the building inspector. This official is empowered to conduct inspections, stop work orders, and take other enforcement actions. Recognizing that smaller towns and villages may not be able to support an inspector with sufficient training to make these determinations, the model ordinance is accompanied by a model inter-municipal agreement that would allow several municipalities to pool their resources when hiring inspectors.

The ordinance also provides applicants with the ability to apply for a partial exemption from the require-

ments of the ordinance based on hardship or infeasibility. Optional provisions would also allow municipalities to exempt certain historic buildings, or buildings where the added cost of complying with the green building standard would exceed a set percentage.

Appeals from determinations of the Green Building Compliance Official may be made to an appellate body designated by the municipality (typically the board of zoning appeals). In drafting the ordinance, CCCL provided for numerous optional add-on provisions as well as procedural options if any actual inconsistencies are found between the LEED or Energy Star requirements, on the one hand, and the preemptive federal or state codes on the other.

Model Commercial Wind Siting Ordinance

CCCL's model commercial wind siting ordinance is designed to help municipalities properly regulate the siting and operation of wind energy facilities so that wind energy is promoted while potential problems are mitigated. The ordinance covers both large/commercial (a single turbine with a rated capacity of 150 kilowatts) and small wind energy conversion systems (WECSs) (a single turbine with a rated capacity of not more than 150 kilowatts and a total height of less than 125 feet) as well as residential wind energy conversion systems (a single turbine with a rated capacity of not more than 10 kilowatts and a total height of less than 50 feet). In arriving at the kilowatt production values and height limitations for large/commercial, small and residential WECSs, CCCL chose the higher end values adopted by local municipalities so as to bring more WECSs within the less onerous siting requirements of the small WECS and to thereby encourage wind energy.

The model wind ordinance sets out a permitting and site plan approval process for the different WECSs. The ordinance recommends that municipalities allow small wind energy facilities in all districts other than residential, and that large wind energy facilities, while more suited to rural districts, should be permitted in any district deemed appropriate by the municipality.

In order to assure the safety of the proposed WECS, a number of requirements must be met before an applicant can obtain a special use permit for construction. The applicant must, among other things, provide assessments regarding the nature of the proposed site location and its surrounding area. A full Environmental Assessment Form (EAF) under the State Environmental Quality Review Act (SEQRA) is required as well as a detailed construction and installation plan. Applicants must make plans for the operation and maintenance of the facility including provisions for emergency response and fire control plans. Optional provisions provide additional considerations when a WECS is proposed on a historic site or near a wetland or important avian area.

In addition to safety, an applicant for a special use permit is required to provide analysis of potential negative externalities that may arise from the construction of the wind turbine. The applicant must analyze the visual impact of the proposed WECS and provide ways in which that impact can be lessened. The applicant must also consider potential electromagnetic interference with communication systems as well as possible geothermal impact from tower installation.

Two important areas which have generated the most controversy in siting wind energy facilities are noise and avian impacts. Applicants under the CCCL ordinance must describe the proposed project's noise impacts and its noise control features. Applicants must additionally analyze bird and bat populations whose migration, nesting, or habitat might be affected by the proposed WECS. In order to assure mitigation efforts, the CCCL ordinance then requires the applicant to solicit input from the New York State Department of Environmental Conservation on those studies and follow any protocols established by DEC.

Additional factors that require consideration for a special use permit to be granted relate to the potential for ice throw, blade throw, and catastrophic tower failure. An engineer must certify that the proposed wind facility can withstand wind-loading requirements set out under New York State's Uniform Construction Code. Optional provisions also would require the engineer's report to include analysis of shadow flicker, potential fiscal and economic impacts of the proposed project as well as potential land use and water impacts.

Once a special use permit application is completed, the ordinance lays out a procedure for its review. Applications are submitted to the municipal clerk for processing, and the municipal planning board is required to conduct at least one public hearing prior to reaching its decision as to whether to grant the special use permit, grant the special use permit with conditions or deny it. The municipal planning board is charged with conducting a review under SEQRA.

In reaching its conclusion on whether to allow a WECS to go forward, the planning board is provided with a number of standards. A WECS must meet certain safety standards which place limits on the system's height, blade placement, rotational speed and override controls. A WECS must have safety provisions such as anti-climbing features, protection of electrical equipment from attractive nuisance and warning lights for aircraft where certain tower heights are reached. The ordinance requires evidence of a signed interconnection agreement with the local electric utility prior to construction of the WECS.

WECSs must be properly set back from surrounding properties. The ordinance offers a range of setback requirements which are tied to the size of the conver-

sion system, its proximity to property lines, overhead transmission lines or public roads, and the distance from residences, schools, hospitals, churches or public libraries. The wind ordinance allows for a waiver of setback requirements where there is written consent from an affected property owner at the beginning of construction.

In order to appropriately address the issue of nuisance, prior to planning board approval of the wind turbine project, an applicant for a WECS would be required to ensure that the noise level generated by the WECS will not exceed 45 A-weighted decibels (dBA) measured at the site property line. The noise level generated by the WECS must not increase ambient sound levels within 2,500 feet of the site property line by more than 3 dBA at any sensitive noise receptors including residences, hospitals, libraries, schools, and places of worship.

Further provisions involve avoiding interference with electromagnetic communications, and minimizing visual impacts of the tower through a prohibition on advertising on the tower, the standardization of color requirements for the tower and blade components, and the provision for landscape screening where possible. An optional provision would also require the minimization of shadow flicker.

Once a WECS has been approved, it must remain in compliance with the ordinance. The WECS must be maintained in operational condition. The ordinance affords an owner 90 days to remedy a situation where the wind energy conversion system becomes inoperative, damaged, unsafe, or violates a permit condition or standard. If the WECS is not repaired or brought into permit compliance within the allocated time frame, the municipality may, after public hearing, order remedial action or revoke the special use permit of the system. All wind energy facilities are required to be inspected annually for structural and operational integrity by a New York State licensed professional approved by the municipality.

Other sections of the model ordinance deal with issues relating to site abatement and decommissioning, liability insurance, provisions for the transfer and replacement of a WECS or of ownership rights, as well as the installation of wind measurement towers prior to the construction of a WECS.

The model ordinance directs the municipality to appoint a staff member or outside consultant to enforce the provisions of the ordinance. That code enforcement officer may issue a stop work order at any time for violations of the ordinance, the special use permit, the building permit or the site plan approval. The ordinance further affords the municipality authority to take any action necessary to prevent, correct or abate any unlawful erection, structural alteration, reconstruction or use. Anyone who is found to be in violation of the ordinance would be subject to monetary penalties.

Model Residential Solar Siting Ordinance

CCCL's forthcoming model solar ordinance is designed to promote the accommodation of small scale solar energy systems and to protect access to sunlight to assure the most efficient use of those systems. The ordinance regulates all solar energy systems of up to ten kilowatts which are installed in residential or commercial districts. The goal of the ordinance is to strip away as many of the procedural barriers to solar installation while insuring that safety concerns are adequately accounted for.

In order to maximize opportunities for solar installation, the model solar ordinance permits outright, as an accessory use, the installation of passive and building integrated photovoltaic systems. Rooftop and building mounted solar collectors are also allowed as an accessory use in all districts but require building permits prior to installation. The ordinance does not impose a height limitation on building mounted solar collectors so long as those collectors are erected only to such height as is reasonably necessary to accomplish the purpose they are intended to serve. Ground mounted and free standing solar collectors are allowed as accessory structures in all zoning districts subject to building permit and applicable setback requirements.

In order to ensure the proper siting of solar installations, solar energy systems will only be granted a building permit if they are determined by the municipality not to present any unreasonable safety risks relating to weight load, wind resistance and access in the event of a fire. All solar installations are required to be performed by a qualified solar installer as defined in the ordinance. All electrical connections must be inspected by a municipal code enforcement officer.

The ordinance allows for net-metering arrangements which can reduce load on the public utility grid. Any connection to the grid must be inspected by the appropriate public utility. The ordinance has several provisions which deal with appeals from the denial of a building permit. If a municipality wants to further encourage solar installation, an optional provision allows municipalities to afford all building permit applications expedited review and waiver of building permit application fees.

CCCL's model solar ordinance has an optional section on ways municipalities can make planning decisions that take full advantage of potential solar power generation. This includes setting the orientation of buildings and streets with respect to sun angles so as to provide

maximum southern exposure for solar collectors. It also allows for the consideration of the type and placement of shade trees along streets so as not to block access to existing solar collectors, and the platting of subdivisions so as to allow for solar access by all future residents. Finally, there is an option to regulate a property owner's planting of shade trees which would have the effect of casting a shadow of ten percent or greater on a neighbor's existing solar collector during the hours of 9:00 a.m. to 3:00 p.m. The model solar ordinance will be available on CCCL's website in the upcoming weeks.

CCCL welcomes comments on any of the model ordinances. The model ordinances and the supporting databases are available at <http://www.law.columbia.edu/centers/climatechange/resources/municipal>. Comments on the green building ordinance can be directed to Michael Gerrard at Michael.gerrard@law.columbia.edu. Comments on the wind and solar ordinance can be directed to Danielle Sugarman at dsugar1@law.columbia.edu.

Endnotes

1. International Energy Agency, *Energy Technology Perspectives 2010—Scenarios & Strategies to 2050*, (2010) at 49.
2. U.S. Energy Information Administration, *Renewable Trends in Consumption and Electricity*, (2008). Available at: <http://www.eia.doe.gov/cneaf/solar.renewables/page/trends/rentrends.html>.
3. See U.S. Dep't of Energy, 20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Electricity Supply, (2008). Available at: http://www.awea.org/learnabout/publications/upload/20percent_Wind_factsheet.pdf.

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