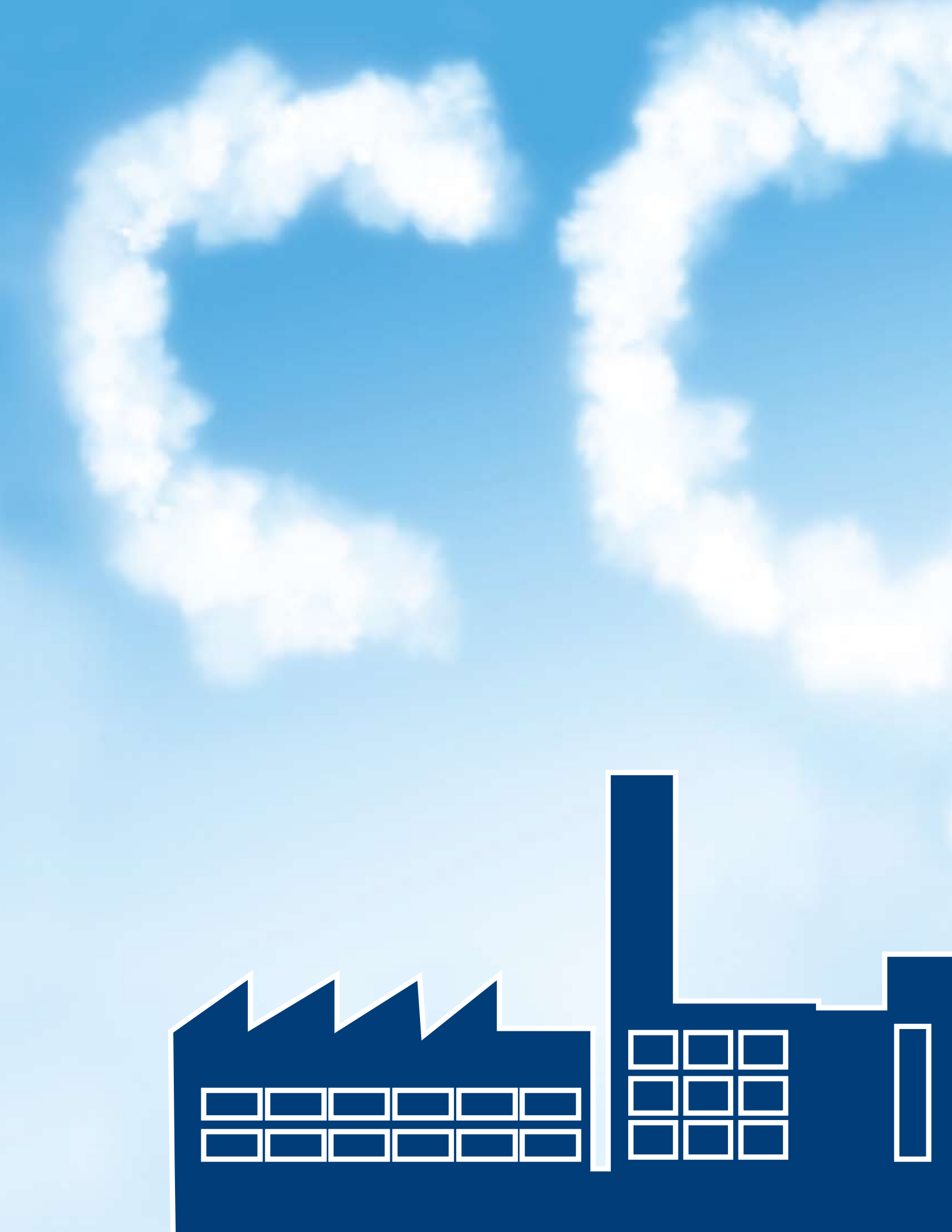

Carbon -Neu+rality and the Use of Offsets

MANY ORGANIZATIONS, INCLUDING COLLEGES and universities, are moving to address the threat of climate change by reducing greenhouse gas (GHG) emissions from their operations. For example, the rapid growth of participation in the Presidents Climate Commitment (PCC) now means that more than 600 colleges and universities have pledged to develop plans to become carbon neutral. So what does this mean?

Carbon neutrality is defined as achieving a state where the operation has zero-net emission of greenhouse gases. The key word here is "net." It is highly unlikely that an organization will be able to achieve zero absolute emissions of greenhouse gases, since most forms of energy, many materials, and wastes all contribute to GHG emissions. This means that despite aggressive programs to switch to renewable energy, and reduce consumption and waste, credits or offsets must be purchased to counteract those emissions that the institution cannot prevent emitting. The result of the Presidents Climate Commitment is that over 600 colleges and universities are now committed to reducing their own GHG emissions. Because they cannot realistically reduce their own emissions to zero, they will be out in the marketplace looking to purchase the rights to carbon offsets. Buyer beware.

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WHAT IS A CARBON OFFSET?

It is important to first define what a carbon offset is. *Carbon* is used in this context interchangeably with *greenhouse* gases. This is done because although there are numerous types of GHG, the differential effect of each can be converted into a common term of carbon dioxide-equivalents (CO_2-eq) based upon their relative effectiveness at producing heat once released to the atmosphere. In turn, carbon dioxide can be related to the carbon portion of the compound using molecular weight ratios.

All of this means that the term *carbon offset* refers to a reduction in emissions of any GHG, such as methane, nitrous oxide, or even sulfur hexafluoride. The *offset* is a quantified GHG reduction purchased and used to negate or cancel out an equivalent emission from the operation.

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WHERE DO CARBON OFFSETS COME FROM?

In general terms, carbon offsets come from a variety of projects that either pull GHG from the atmosphere, reduce the amount of GHG historically emitted to the atmosphere, or avoid future GHG emissions by stopping or changing future developments. *Sequestration* (preserving carbon in storage) projects pull carbon dioxide from the atmosphere through photosynthesis (biological sequestration) or by capture and underground injection of exhaust CO_2 (terrestrial sequestration).

Reduction projects can include energy efficiency improvements, fuel switching to lighter fossil fuels or biofuels, or the destruction of methane from animal wastes or landfill gas – projects where the amount of GHG emitted can be reduced from previous levels. *Avoidance* offsets could occur if, for example, a planned coal-fired power plant was pulled from future plans or was shifted to lower-emitting options.

NOT ALL CARBON OFFSETS ARE CREATED EQUAL

Care must be exercised when evaluating different projects for the quality of their claimed carbon offset. There are a series of criteria that a potential offset must meet in order to be deemed adequate for use in the carbon neutrality calculation of the PCC. Many of these qualities are somewhat subjective and can be quite difficult to evaluate. We describe a few of the criteria here that the offset must meet:

- ***Additional*** – the concept of additionality says that an emission reduction can only be considered as an offset if the project that created the reduction would not have happened without the lure of the offsets themselves, or if

the action was otherwise required. Example 1: if an electric utility was required to install carbon dioxide capture and injection equipment as a term of a permit, no offset is created because the action was otherwise required by regulation. Example 2: if an operation has traditionally performed more inefficiently than its peers, offsets would not be created by a project that brings that poor operation up to the standard efficiency of its peers. Only to the extent that the efficiency exceeds benchmarks would offsets be awarded.

- ***Measureable*** – an offset credit must be measurable. This sounds rather straightforward, yet the amount of carbon sequestered within a forest or agricultural field can be extremely complex and therefore quite expensive to quantify; determining the actual amount of energy saved through implementing efficiency measures can also be a daunting task. The buyer of an offset should be in a position to evaluate whether the proposed offset has been measured, or estimated with sufficient conservatism, to ensure that the offset does in fact represent the intended amount of reduction.

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- ***Permanent*** – a project or change that results in an emission reduction could be deemed as an offset provided the project or change results in permanent reduction. Imagine a facility switching from coal to natural gas combustion one year and selling the emission reductions as offsets, only to switch back to coal in year two. Permanence is determined by a relatively straightforward evaluation for most projects, but remains a challenge for biological sequestration projects. An offset buyer could purchase offsets from a forest only to see a fire burn the

land in future years, releasing all of the carbon that was credited as offsets. A number of methods have been developed to try to address permanence for these bio-processes; the use of a buffer or pool of excess credits that must be maintained (i.e., the buyer may only take credit for 75 percent of purchased offsets) and specialized insurance to provide some protection to buyers are two examples.

- ***Avoid Leakage*** – leakage is terminology developed to describe the shifting of emissions from one source to another. Example: a great number of offsets could be generated if an electric utility shut down an existing power plant; however, if that shutdown resulted in another power plant picking up the same load, the reduction would have leaked from one plant to the other and no offset would be generated. Leakage can be difficult to determine and remains a subjective analysis – the key is to clearly draw boundaries for your analysis and view impacts of the project "as the atmosphere sees it."
- ***Verified or Verifiable*** – the number of offsets claimed by the project or seller need to be verified by an independent third party having established credentials for determining offsets. Different projects may require different levels of verification, depending on applicable protocols and standards.
- ***Registered*** – there are a number of registries that have been developed over the years to keep track of specific emission reductions. The purpose of a registry is to ensure that the same emission offset is not double counted. When an offset is generated and verified, it is reported and recorded in the registry and the disposition of the offset is tracked via the sales agreement.
- ***Enforceable*** – the offset transaction must be enforceable through a contract. The contract must clearly define the offset and the actions required in order for the offset to remain valid.

Organizations will need to chart a course through challenges of energy efficiency, waste minimization, purchase of green power, and development of local renewable energy sources.

WILL RENEWABLE ENERGY CREDITS (RECS) ALSO FUNCTION AS OFFSETS?

A Renewable Energy Credit (REC) represents the positive environmental attributes of "clean" electricity; that is, the REC stands for the amount of sulfur dioxide, nitrogen oxides, particulate matter, and carbon dioxide that are *not* emitted when this clean energy source displaces a more polluting source. A REC does not represent a ton of a particular pollutant as a carbon credit does, but rather is the amount of various pollutants tied to a kilowatt hour (kWh) of electricity. RECs have existed for several years now, resulting from the creation of Renewable Portfolio Standards (RPS) for electric generation within states. Utilities could generate electricity from renewable sources to meet their targets

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Carbon Offset Contacts

Carbon Fund
www.carbonfund.org

Chicago Climate Exchange
www.chicagoclimatex.com

e-Blue Horizons
www.e-bluehorizons.net

Environmental Defense Fund
www.edf.org

Native Energy
www.nativeenergy.com

Terra Pass
www.terrapass.com

The Carbon Neutral Company
www.carbonneutral.com

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and then sell any excess renewable power back into the marketplace via RECs.

Given their development from a variety of state regulations, there is quite a variance among RECs in terms of quality and cost. Various regulatory and voluntary REC certification groups can provide review and certification that the RECs meet specified quality requirements. Although a REC may be certified for regulatory use for meeting RPS requirements, this certification may or may not meet carbon offset requirements. Example: a 2005 cogeneration project is eligible to sell RECs for 2008 into a state power market, but could not qualify as carbon credits for a program starting in 2007. Additionally, the REC certification may not have required the leakage test that a carbon credit faces. The PCC specifically cautions colleges and universities against relying heavily on RECs to meet their carbon neutral pledge because of these uncertainties.

STRATEGIES FOR MANAGING THE CARBON FOOTPRINT AND CARBON NEUTRALITY

We are all venturing off into the great unknown as we seek to reduce GHG from our operations. Organizations will need to chart a course through challenges of energy efficiency, waste minimization, purchase of green power, and development of local renewable energy sources. The carbon offset will also play a significant role in making carbon neutrality a possibility. Special care must be taken to determine the quality of a carbon offset to ensure that it is recognized by the PCC or by other voluntary or regulatory programs aimed at GHG reduction.

There are many surprises out there. In many cases a project that would appear to offer carbon offsets may have no value, because contractual terms may take ownership of the "environmental attributes" away from the project owner. Due diligence, knowledge of greenhouse gas accounting rules and offset requirements, and an understanding of environmental credit markets will help the organization navigate through the difficult decisions ahead on the path to carbon neutrality.

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