Voluntary Carbon Offsets for Small Jurisdictions (#2 Long Version)
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Contents:

I. Background

The City of Eugene has made a legal commitment to achieve carbon neutrality, and the University of Oregon has also expressed interest in decreasing its carbon footprint. These actions are a local response to a general lack of climate policy response at the national level and an increasing sense of urgency to enact meaningful policy.

The essence of carbon offsets is to compensate for difficult or unavoidable emissions by purchasing actions which capture the equivalent carbon elsewhere. For example, it is currently difficult to imagine how Eugene would obtain carbon neutrality while maintaining services such as fire trucks, police vehicles, and heated, electrified buildings. Offset projects might include projects like methane emissions capture from a municipal landfill or sequestering carbon in forests. Offsets are controversial within some sectors of society for reasons addressed below. Contemporary review of the topic also suggests that confidence in carbon offsets may have improved recently, but that offsets retain characteristics that warrant careful attention.

The intention of this working paper is to: 1) familiarize the PI research team with the issues involved to assist related internal research; 2) share findings with community members to gauge citizen feedback and assist in the conversation about policy options for institutions and NGOs; and 3) propose policy recommendations when justified by evidence. In order to do so, this paper briefly explains how the carbon offset market is structured, identifies the potential advantages and disadvantages of carbon offsets generally, and provides recommendations about the offset market for the City of Eugene, the University of Oregon, and other interested organizations. This paper is subject to periodic updates as new findings are observed.

II. Carbon Offset Market Structure

The carbon offset market is divided into regulatory compliance and voluntary markets (Seeberg-Elverfeldt, 2010).[1] In the compliance market, regulated entities must comply with GHG emission reduction regulations and offsets may be used as "an alternative compliance mechanism to allowances or direct emission reductions (Kollmuss, et al., 2010)." These offsets are provided by systems such as the Clean Development Mechanism (CDM) for the European Union, or California's approved offset mechanisms for the state's cap-and-trade system.[2] The voluntary market provides offsets for unregulated entities that wish to address their emissions. Some offsets produced in the compliance market may also be sold in the voluntary market (Kollmuss, 2007) and (Lovell, 2010). Eugene's carbon neutrality ordinance could fall under either regulatory compliance or voluntary – regulatory because the ordinance is a legal compliance obligation or voluntary because it is undertaken on the jurisdictions own volition. Based on our understanding of compliance and voluntary markets, we consider Eugene's interest in offsets to fall in the voluntary category.

Carbon offset projects can be divided into four categories: 1) renewable energy projects, 2) energy efficiency projects, 3) greenhouse gas capture projects, and 4) biosequestration projects (Kollmuss, 2007). An operating presumption in this paper is that valid offsets meet quantifiable, quality-based criteria through a third party audit. The list below[3] compiles the factors considered to be important for offset quality; however, offset providers and verifiers define these factors differently. In general, a good quality offset meets criteria which include:

1. Real emission reductions or carbon capture;
2. Accurate measurement against a baseline;
3. Carbon reductions are viable because of additional support for the project that would not occur under business as usual circumstances (generally called "additionality");
4. Reductions should be permanent (permanence is variously defined);
5. Offset validity is independently verified by an independent third party;
6. Projects should be transparent to stakeholders;
7. Projects should be temporally synchronous with emissions being offset (ACUPCC p.21);
8. Projects should account for leakage (resultant emissions due to consequent activities);
9. Projects should be registered and retired (taken off of the market so that resale cannot occur); and
10. Projects should not be double-counted.

[1] *See also* Stockholm Environment Institute. *Mandatory & Voluntary Offset Markets*. 2011. Available at: http://www.co2offsetresearch.org/policy/MandatoryVsVoluntary.html.

[2] More information on the Clean Development Mechanism is available at: https://cdm.unfccc.int/.

[3] The standards were taken from: Shrink That Footprint, *Take further climate action*, available at: http://shrinkthatfootprint.com/take-further-climate-action#UDHB63GceEmQrQHY.99; and American College & University Presidents Climate Commitment, *ACUPCC Voluntary Carbon Offset Protocol*, November 2008. Available at: http://www2.presidentsclimatecommitment.org/documents/ACUPCCVoluntaryCarbonOffsetProtocol_Nov08.pdf.

a. Market Size, Purchase Options, Vendors, and Pricing:

1) **Market Size**: In 2013, the worldwide voluntary market transacted 76 $MtCO_2e$ of offset projects, worth around $365 million (Peters-Stanley and Gonzalez, 2014). Although this amount is less than in 2012 and previous years, some of the decrease in market value is a result of increasing compliance market activity – which is now valued at around $30 billion globally.[4]

2) **Purchase Alternatives**: There are several ways to invest in offset projects, but each has particular risks and costs (*see* Table 1 in Appendix A). Offset credits can be purchased at the retail or wholesale level, or organizations can invest in or develop their own projects. The contracts governing these purchases can vary substantially, but three of the main contractual types are: "prompt delivery" of offsets that have already achieved guaranteed emission reductions; "forward delivery" of offsets that are guaranteed to deliver emission reductions in the near future; and "forward crediting" of offsets that have yet to be produced and for which there is no guarantee offset production will occur.[5]

3) **Vendors and Pricing**: In the voluntary market there are numerous offset vendors. However, it is difficult to find offset prices for individual projects. Much of the information available is on global average price (*see* Figure 2 in Appendix A), which was $4.9/$tCO_2e$ in 2013 (16% price decrease from 2012) (Peters-Stanley and Gonzalez, 2014). As the Stockholm Environment Institute (SEI) notes:

> Prices for voluntary offset credits vary significantly based on the standards used, project types, project locations, offset quality, delivery guarantees and contract terms. There are no readily available metrics for consumers to determine either how the price of offset credits sold in the voluntary market is determined, or the role the offset price has on the quality of the offset purchased.[6]

Current as of July 2014, two vendors listed retail prices at $13.12/mT,[7] and at $14/mT,[8] and in early 2013 offset prices between $11.50 and $16 were observed (Bowerman, 2014). To determine an accurate price for a mid or small-sized buyer such as the City of Eugene or the University of Oregon, direct consultation with the offset provider is recommended. One provider with prior local experience described the scale and specification of a university offset purchase as being economically impractical when

[4] *See State & Trends Report Charts Global Growth of Carbon Pricing*. Available at: http://www.worldbank.org/en/news/feature/2014/05/28/state-trends-report-tracks-global-growth-carbon-pricing.
[5] For an extended discussion of purchase types and contractual differences, *see Investing in Carbon Offsets: Guidelines for ACUPCC Institutions*, at 16-17, available at: http://www2.presidentsclimatecommitment.org/documents/CarbonOffsetsGuidelines_v1.0.pdf.
[6] *See Market Size and Scope*. Available at: *http*://www.co2offsetresearch.org/policy/Market.html.
[7] Available at: http://www.terrapass.com/shop/.
[8] Available at: http://www.nativeenergy.com/buy-now.

compared to commonly available certified offsets in the open market (Fishman, 2014). Thus, the range of prices available depends upon the jurisdictional specifications for the purchase. One buyer reported that third party verified non-local offsets are presently available for under five dollars/mTCO_2e, whereas local projects could be considerably more expensive (Zuelner, 2014). However, the present abundance of projects and dearth of buyers might find the situation reversed, with local projects being more economically priced than distant projects.

b. Third-Party Verifiers

Several organizations approve and develop verification protocols for the majority of third party verifiers of voluntary market offsets (*see* Figure 11 in Appendix A). Although the standards used by third party verifiers are sometimes a combination of multiple organizational standards, the most widely used protocols (ranked in descending order of market share) are:

1. The Verified Carbon Standard (VCS)[9] – 47% of market;
2. The Gold Standard (GS)[10] – 16% of market;
3. The Clean Development Mechanism (CDM)[11] – 7% of market;
4. The Climate Action Reserve (CAR)[12] – 5% of market;
5. The American Carbon Registry (ACR)[13] – 1 % of market;

However, note that some 21% of offsets in the voluntary market are verified by "internal/proprietary" (non third-party) standards. Experts at the Ecosystem Marketplace explain this preference for internal verification by saying:

> While previous years saw consolidation around a few key independent, peer-reviewed standards, more than one fifth of transacted offsets reported following an internal/proprietary standard in 2013. This includes activities associated with emerging subnational (or "jurisdictional") programs for which consensus around program development, measuring, monitoring, and safeguards approaches is only recently emerging from market shapers like the World Bank's Forest Carbon Partnership Facility – which will invest in and support activities exclusively at the jurisdictional scale (Peters-Stanley and Gonzalez, 2014).

The City of Eugene and the University of Oregon might choose to internalize verification of offset projects due to high unit costs for small projects from recognized third party auditors, which could help to induce third party auditors to address cost efficiency of small projects. Additionally, innovative standards and validation could emerge through jurisdictional cooperation.

[9] *See* http://www.v-c-s.org/.
[10] *See* http://www.goldstandard.org/.
[11] *See* https://cdm.unfccc.int/about/index.html.
[12] *See* http://www.climateactionreserve.org/.
[13] *See* http://americancarbonregistry.org/.

III. Potential Advantages and Disadvantages of Carbon Offsets

Carbon offsets are controversial because there are compelling arguments for and against the use of offsets. The following list of potential advantages and disadvantages is primarily derived from the Stockholm Environment Institute's (SEI) Carbon Offset Research & Education (CORE) project.[14]

a. Potential Advantages

- Encourages tangible action(s) presumed to cancel negative impacts for entities who may otherwise find it impossible to obtain zero emissions;
- Possibility of broad voluntary participation by unregulated entities;
- Preparation for future participation in carbon pricing systems;
- Policy innovation sets an example for others to follow and provides a response to public demands for action;
- Public relations benefits accrue to entities that voluntarily reduce emissions;
- Decreased cost of change encourages carbon pricing and increases political viability for early adopters, which may accelerate the long-term, overall emission reduction pace; and
- Entities in wealthier areas can finance projects within less developed or affluent areas, leapfrogging the historic transition characteristic of high energy intensity, and contributing to increased economic equality.

b. Common Criticisms of Carbon Offsets

- Some projects may have happened even if they were not purchased (non-additional);[15]
- Developed/wealthy entities can rationalize unsustainable behavior by buying cheap offsets which may not achieve claimed benefits;
- Lack of transparency, weak quality assurance standards, and poor audit quality sometimes damages public confidence;
- Developers paying for third party audits raises potential conflicts of interest;
- If offsets create wealth or prosperity, new spending results in "rebound" activities that increase emissions, negating the neutrality of the investment;
- The choice to offset defers direct carbon reductions, which may be more difficult yet more permanent, as well as more expensive over time;
- Offset pricing in the voluntary market is volatile and offsets are sometimes unavailable;[16] and

[14] *See Are Offsets a Scam?* Available at: http://www.co2offsetresearch.org/consumer/GoodorBad.html.

[15] Concern over non-additional projects is the most common criticism of carbon offset markets because these projects could lead to "fraud on consumers; increased uncertainty about the value of other carbon currencies; and lower public confidence in emissions trading systems." *See* Wara, Michael, *Carbon Offsets: This house believes that carbon offsets undermine the effort to tackle climate change, The proposer's opening remarks*; The Economist; December 4th, 2008; available at: http://www.economist.com/debate/days/view/249.

[16] "Like energy and commodity markets, Carbon Markets have proven to be highly volatile at times, meaning that prices have fluctuated substantially under changing supply and demand. Buying and selling carbon credits designed

- Some offset projects, typically biosequestration projects, have questionable permanence and different measures of permanence (e.g. 100 year or 20 year accounting periods).

IV. Recommendations to the City of Eugene

The City of Eugene (COE) recently adopted a Climate Recovery Ordinance requiring that:

> By the year 2020, all city-owned facilities and city operations shall be carbon neutral, either by reducing greenhouse gas emissions to zero, or, if necessary, by funding of verifiable local greenhouse gas reduction projects and programs or the purchase of verifiable carbon offsets for any remaining greenhouse gas emissions.[17]

In 2010, COE believed they could get 55% of the way to carbon neutrality through internal actions by 2020.[18] Even though it was predicted that 45% of COE's carbon footprint would be unaddressed in 2020, city policy discussions made it clear that "the purchase of offsets is to be considered a secondary strategy to be used only after all practicable operational reductions have been made."[19] We take this to mean that implementation of offsets might be put off until 2020, presumably to emphasize in-house carbon reductions. It seems unlikely to us that net zero emissions will be obtained exclusively in-house within five years. If the carbon neutral component of the ordinance is intended to mean what it says, it seems that an offsets component will be a necessary part of the equation. Because offset baseline analysis and policy options take time to produce, we advise that offset policy commitment as well as project selection occur considerably earlier than 2020 in order to fulfill the ordinance's requirements. Furthermore, evidence suggests that purchasing offsets provides a price incentive to more effectively reduce internal emissions in subsequent years, which may increase the likelihood and reduce the burden of achieving carbon neutrality.[20]

We also note that the City Manager should define early on what "verifiable" and "local" mean within the context of applying the Ordinance.[21]

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specifically for non-compliance purposes (also known as voluntary carbon offsetting) can be difficult and sometimes not possible." *See* International Carbon Reduction and Offset Alliance; *Statement on the suitability of Carbon Credits for investment by the General Public*; May 2014; available at: http://www.icroa.org/40/sale-of-vers-to-the-public/.

[17] *See* Eugene Code; Ch. 6, *Environment and Health*, Sections 6.675, 6.680, 6.685, AND 6.690, at 87 (forthcoming); available at: http://www.eugene-or.gov/DocumentCenter/Home/Index/262.

[18] *See* City of Eugene *Internal Climate Action Plan*, at 4; available at http://www.eugene-or.gov/ArchiveCenter/ViewFile/Item/84.

[19] Ibid. at 25.

[20] *See Investing in Carbon Offsets: Guidelines for ACUPCC Institutions*, at 13, available at: http://www2.presidentsclimatecommitment.org/documents/CarbonOffsetsGuidelines_v1.0.pdf.

[21] Previously, COE planned to purchase offsets from the Bonneville Environmental Foundation (BEF) "because of the regional nature of their investment and third-party certification of offset quality," giving some insight into acceptable verification and locality standards. *See Internal Climate Action Plan* at 25; available at: http://www.eugene-or.gov/ArchiveCenter/ViewFile/Item/84.

Beyond the "verifiable" and "local" criteria in the Ordinance, the COE should aim to purchase offsets that meet the standard of practice mentioned above (see pg. 2). We also agree with SEI that offset purchases should seek to satisfy the following:[22]

1. Reduce GHG emissions in an economically efficient way;
2. Enhance the social and environmental benefits to project hosts beyond carbon reduction;
3. Stimulate social and technological innovation and participation by new actors, sectors, and groups;
4. Create and build constituencies for more effective and comprehensive national and international solutions;
5. Avoid perverse incentives that could stymie broader climate protection actions and policies (such as highway expansion projects); and
6. Synergistically work with other climate protection measures.

Several of these considerations deserve further explanation. First, there is an ongoing discussion about whether offsets are economically efficient long term emission reduction mechanisms. SEI notes that:

> [Offsets] may provide desirable near-term cost advantages, but at the risk of "locking-in" higher emissions infrastructures and higher costs in the longer term. Where the cost of implementing offset projects is significantly lower than the market price of offsets, as is the case for many non-carbon dioxide (CO_2) types of project (e.g. HCFC destruction projects), offsets may provide a useful transition mechanism but ultimately other mechanisms, such as direct incentives or regulation, could achieve deeper reductions more quickly and at lower cost.[23]

Second, offsets may produce social and environmental benefits – often termed co-benefits. Co-benefits likely will strengthen public support and ensure that COE's carbon neutrality policy is politically viable. Many offsets claim to have co-benefits, including reduced reliance on fossil fuels, habitat conservation, biodiversity protection, job creation, water quality improvement, and improved local air quality. However, co-benefits are difficult to value and verify.[24] Yet, because the associated co-benefits can be a decisive factor in public support and in pricing differences between offsets, the COE should at a minimum name the co-benefits associated with a project.

Third, COE should evaluate how new policies may interact with potential carbon pricing by the state or federal government, keeping in mind that carbon pricing predictions are speculative and politically contentious. For example, if the model of current operational cap and

[22] See *Are Offsets a Scam?* Available at: *http*://www.co2offsetresearch.org/consumer/GoodorBad.html.
[23] See *Introduction to Offset Policies*. Available at: http://www.co2offsetresearch.org/policy/index.html.
[24] Personal conversation with Joshua Skov, Sustainability Consultant, July 2014. *See also* Lovell, *Governing the carbon offset market*, at 359. (Stating that as of 2010, "the VCS—the current market leader—ultimately decided to focus just on the carbon emission reduction aspects of voluntary offset production, because of the difficulties in verifying the diverse and hard-to-measure sustainability benefits arising from voluntary offset projects. . .").

trade systems were instituted in Oregon, it is unlikely that an entity the size of the COE would be required to enter the compliance market. In this scenario, offsets purchased in the voluntary market would not function as allowances that could be allotted toward a capped emission threshold; thus, it is unlikely that these offset purchases by COE would fit in a cap and trade system, unless it was designed to include all public entities. If, however, COE purchased compliance-instrument allowances (carbon credits) from compliance systems (e.g. California or RGGI), these could then be re-sold in those markets for a profit if allowances became more scarce due to expansion of industry or a declining cap on jurisdictional GHG emissions. If a carbon taxation scheme on carbon based fuels were implemented, pursuing the right kind of offsets locally might position COE for success. For example, if projects led to decreased fossil fuel use over time, citizens would be better able to absorb increased tax burdens, or even make a profit in the case of a revenue neutral fee and dividend system.

Furthermore, despite the risk of oversimplifying a complex topic, it is worth noting that other policy proposals directed toward addressing climate change are emerging, albeit on varied timescales. For example, there is movement in Oregon toward adopting additional "Clean Fuel" policies. In February 2014, the Oregon Department of Environmental Quality was directed by Governor John Kitzhaber "to draft rules for the next phase of the Clean Fuels Program, which include the requirement to reduce the carbon content of Oregon's transportation fuels."[25] Another development affecting policy in Oregon is the EPA's proposed rules for reducing carbon pollution from existing power plants. However, the implementation of this rule and the modification of Oregon's State Implementation Plan (SIP) to conform to the rule will likely take many years to complete. The content of the new SIP could have large impacts on emission reduction efforts in Oregon, but it is too early to know what these impacts may be.

V. Recommendations to the University of Oregon

Unlike the City of Eugene, the University of Oregon (UO) has already engaged in the voluntary carbon offset market by purchasing offsets from the Climate Trust in 2010. That offset project was to be verified annually by a credible third party auditor, but may not have been verified by one of the main third-party verification standards previously mentioned (American Carbon Registry verification was under consideration). Given our insights from an official at Bonneville Environmental Foundation and others, this is likely because the marginal unit price of verification would be unnecessarily high for this small custom tailored project if robust third-party verification had been included. The official also described a previous inquiry from the UO about purchasing a relatively small quantity of "local" offsets. She believed that this was impractical for the university to pursue in comparison to readily available, pre-packaged retail or wholesale offsets because of the increased overhead and monitoring costs that attach to specially tailored deals (Fishman, 2014).

[25] *See Oregon Clean Fuels Program*. Available at: http://www.deq.state.or.us/aq/cleanFuel/.

In 2012, the UO ceased carbon offset purchases when purchasing authority for funds derived from the EMU (the UO student union) were transferred to student leadership. Students chose to support student-lead and campus-based activities rather than offsetting the carbon emissions of EMU activities. Several rationales for purchasing changes were offered, including unwillingness to spend funds away from campus and the incentive to accrue influence at the office which administers the fund (Mital, 2014). This outcome illustrates the tenuousness of voluntary carbon neutrality, confidence in non-immediate projects (in locale and time), and the potential for managers to seek influence via the handling of funds.

If the University of Oregon, as a signatory to the American College & University Presidents Climate Commitment (ACUPCC), should once again redress carbon emissions through carbon offsets, the following previously adopted guidelines[26] (some of which are duplicates of the offset standards on pg. 2, *supra, italics are author's*) should be followed:

1. Offset projects are real and emissions reductions are additional;
2. Offset projects are transparent;
3. Emissions reductions are measurable;
4. Emissions reductions are permanent;
5. Emissions reductions are verified;
6. Offset projects are synchronous (emission reductions from project take place in same time period as emissions being offset);
7. Offset projects account for leakage (direct or indirect emission increases elsewhere);
8. Credits are registered;
9. Credits are not double-counted; and
10. Credits are retired (taken off of the market so that resale cannot occur).

The UO also has an internal purchasing protocol;[27] the most relevant portions state that:

1. The projects offer educational benefits to UO faculty and/or students in the execution, impact, or monitoring thereof [of purchased offsets];
2. The carbon offset projects are based in Oregon; and
3. The projects are public in nature, with ancillary beneficiaries being the broadest public possible.

We observe that the culture of sustainability progress at the UO may be slipping. A review of four well known ratings for higher education sustainability programs reveals that the UO is no longer a standout performer (see Appendix B), ranking below many peer institutions including Portland State and Oregon State Universities. Some of these rankings account for carbon reduction policies and innovations, including the depth of structural policies and

[26] *See ACUPCC Voluntary Carbon Offset Protocol*, Available at: http://www2.presidentsclimatecommitment.org/documents/ACUPCCVoluntaryCarbonOffsetProtocol_Nov08.pdf
[27] *See Carbon Offset Purchase Guidelines* (print copy only, contact Steve Mital, Director of Sustainability, University of Oregon)

commitments. While these multi-university sustainability rankings themselves are subject to criticism (Mital, 2014), we believe they could be a lever to examine the internal sustainability commitments and culture of the UO. This analysis should necessarily include carbon emission goals and policies, including an examination of policies that were suspended – such as carbon offsets.

VII. Conclusion

Offsets may have a role to play for institutions the size of Eugene and the University of Oregon. COE and UO express strong preference for local projects, while offset experts say that large-scale actors and their projects drive the carbon offset market and only large projects may cost effectively meet valid verification standards (Fishman, 2014) and (Skov, 2014). That view holds that economies of scale disadvantage small entities seeking verification by a major third party verifier for the likely local projects that their policy standards dictate. However, given the attractiveness of local co-benefits, alternatives to the primary large-actor third party verification standards may be necessary to obtain local objectives. If this route is chosen, proof of project validation and acknowledgement of conflicts of interest in project selection are crucial. The prior controversies over offset validity suggest an emphasis on transparent, well-reasoned, durable, and explicitly applied standards of practice for offset decision-making.

The uneconomical scale dilemma for small jurisdictions might be reduced by joining with other like-minded jurisdictions with a similar geographic base. For example:

> "[i]nitial discussions have been held with the University of Oregon and EWEB concerning the feasibility of developing a local offset mechanism in order to benefit the local economy. Although there does not currently appear to be sufficient demand for a local offset, the concept should be revisited in the second or third timeframe of COE's Internal Climate Action Plan."[28]

However, Fishman and Skov independently opined that economies of scale still would not be met. Their opinion isn't necessarily conclusive, but rather suggests that if the new City Ordinance rekindles the joint venture discussion, a pivotal point of clarification should address economies of scale and joint administrative burden compared to the burden of on-demand open-market verified offsets.

British Columbia may deserve special attention for sourcing of offset projects. BC's public sector commitment to carbon neutrality began at the same time as their 2008 carbon tax. A Crown corporation (the Pacific Carbon Trust or PCT) was delegated to purchase quality offsets sited in British Columbia. However, this system has undergone substantial change in a short time. According to a report by British Columbia's Auditor General, the PCT's offset

[28] *See Internal Climate Action Plan* at 25. Available at: http://www.eugene-or.gov/ArchiveCenter/ViewFile/Item/84.

projects were found to not be credible because they did not meet additionality standards (Doyle, 2013). There were also claims that offsets sold by the PCT to the public were more than double the price of other offsets on the open market, leading critics to characterize the projects as corporate handouts. In the fall of 2013, the PCT was absorbed into the Climate Action Secretariat within the Environmental Ministry (Moore, 2013). The policy emphasis is now on a "Carbon Neutral Capital Program" in which public sector organizations compete for the money that previously went to the Pacific Carbon Trust by proposing projects to reduce emissions, which are selected based on budget and merit.[29] The point of explaining BC's experience is to suggest that administration of local offsets – even at a scale considerably larger than COE, UO, and EWEB combined – can entail significant economic burdens and complexity which might be side-stepped by either purchasing offsets on the national or international market. Or as BC chose to do, entities might simply bypass the offset market completely and enact an internalized projects program despite the challenges of producing valid and verified emission reductions. This approach, like the UO EMU funding discussion above, may be undesirable because shifting focus from carbon neutrality to internalized activity funding may inadequately and inefficiently achieve sustainability goals.

We concur with the common critique that offsets are a less than ideal substitute for more internalized structural change. Thus, the primary emphasis should be meaningful long term structural modifications to institutional emission behaviors. But while these meaningful transformations are occurring, ongoing emissions can actually be modified or neutralized by the purchasing of offsets when emissions are unavoidable. Offsets are different from metaphorical Catholic indulgences because properly implemented they do reduce, capture, or cease emissions which otherwise go unchecked. They also initiate the pricing of emission externalities, which has thus far been lacking in national and international policy.

Given the complexity of carbon markets and the mostly untested interplay of emission reduction policies at different institutional levels, difficulties are bound to arise. This suggests that decision makers for small entities such as COE and the UO should simultaneously balance skepticism and trust in quality assurance and validation procedures for innovative emission reduction policy. Despite the challenging nature of these issues, credible scientific research suggests there is a short time frame available to achieve meaningful emission reductions and thus preserve a habitable climate for current and future generations. We interpret these scientific observations as a call for multiple fronts of action to reduce carbon emissions, even though results are uncertain. We believe that well-designed carbon offsets are a viable tool to include in jurisdictional policy within the immediate timeframe. Doing so can provide real results that are compatible with necessary carbon reduction commitments and demonstrate how pricing carbon externalities leads to quality carbon reductions.

[29] *See Carbon Neutral Capital Program Expanded*. Available at: http://www.newsroom.gov.bc.ca/2014/03/carbon-neutral-capital-program-expanded.html.

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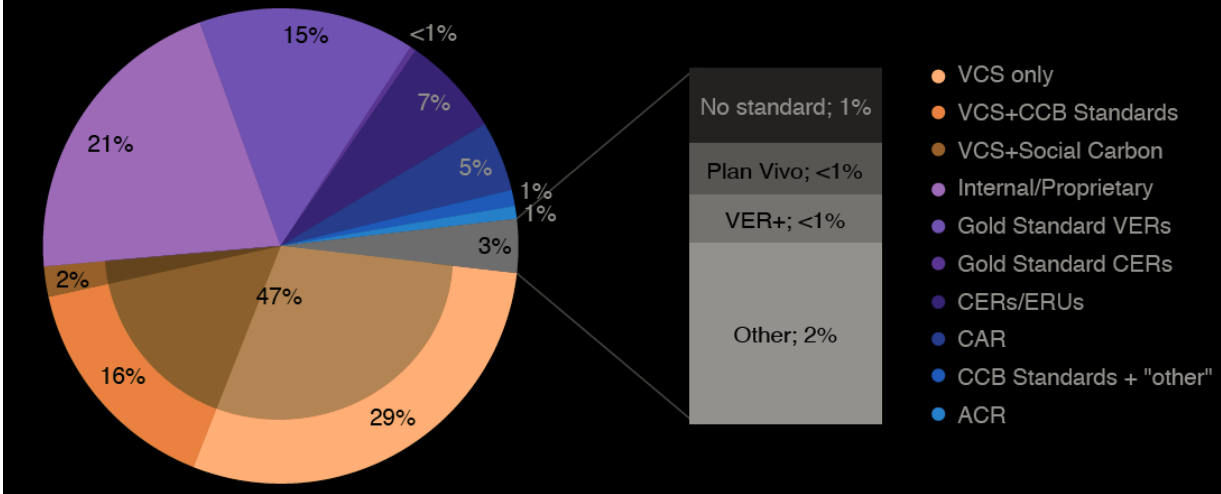
Appendix A – Graphs and Figures:

Table 1. Comparison of Costs and Risks of Offset Investment Options

Offset Investment Options	Risk	Cost
Purchasing Credits – retail	Low	Varies
Purchasing Credits – wholesale	Varies	Varies
Investing in Projects	Varies	High
Developing Projects	High	High
Prompt Delivery	Low	High
Forward Delivery	Low	Low
Forward Crediting	Moderate	Varies

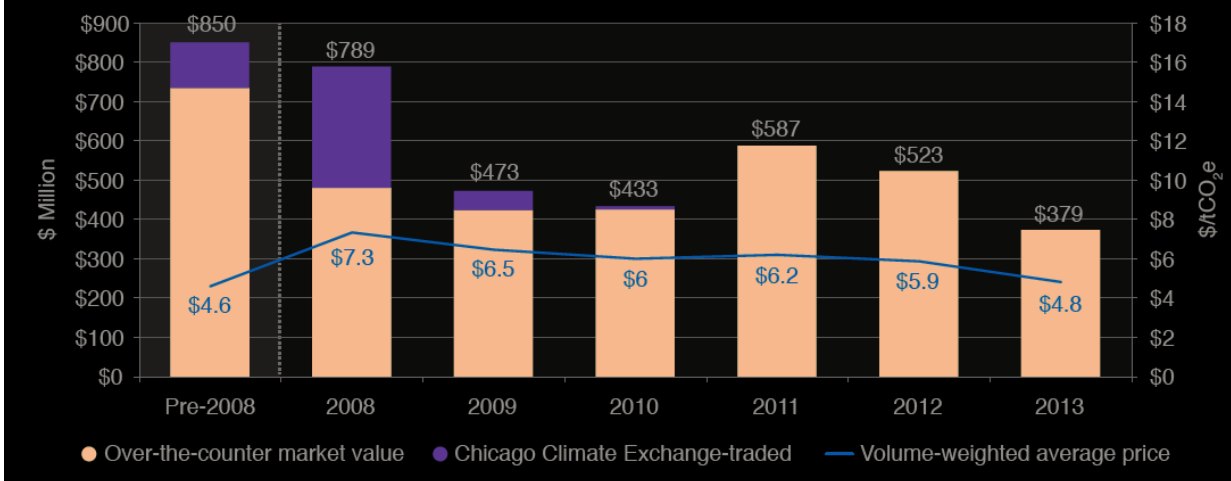
Figure 11: Market Share for Popular Independent Third-Party Standards and Certifications (% Share)



Notes: Based on responses representing 60 $MtCO_2e$ in transacted offset volume.

Source: Forest Trends Ecosystem Marketplace. *Sharing the Stage: State of the Voluntary Carbon Markets 2014.*

Figure 2: Historical Market-Wide Values and Average Prices



Notes: Based on responses representing 76 $MtCO_2e$ in transacted offset volume.

Source: Forest Trends Ecosystem Marketplace. *Sharing the Stage: State of the Voluntary Carbon Markets 2014.*

Appendix B – selected university & college sustainability performance ranking organizations reports from 2013:

Rating entity	UO	OSU	PSU	Criteria applied:
AASHE (Am.Assoc. for Sustainability in Higher Education) aashe	Report filed	Gold	Gold	Curriculum, infrastructure, operations transportation, programs, waste, energy, innovation, career development
Princeton Review princeton review honor roll		Honor roll	Honor roll	Academics, infrastructure, activities, and career preparation, % renewable, carbon reduction binding policy
Sierra Club "cool schools" (#1 score was 850) sierra club rankings national rank	47th 643 points	11th 755 points	32nd 675 points	Curriculum, energy, instruction, innovation, food, investment, purchasing, waste, water use
Kaplan College Guide top 25 rank kaplan		Top 25		Curriculum, campus projects, career development and career options.

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City of Eugene. *Internal Climate Action Plan*, at 4 & 25. Available at: http://www.eugene-or.gov/ArchiveCenter/ViewFile/Item/84.

Doyle, John. Auditor General of British Columbia. *An Audit of Carbon Neutral Government*, at 5-6. March 2013. Available at: http://www.bcauditor.com/pubs/2013/report14/audit-carbon-neutral-government.

Eugene Code. Ch. 6, *Environment and Health*, Sections 6.675, 6.680, 6.685, AND 6.690, at 87 (forthcoming). Available at: http://www.eugene-or.gov/DocumentCenter/Home/Index/262.

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