Possibilities for market-based environmental governance via Second Life

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August 2007

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AUTHOR'S BIO

My name is Stephanie Gerson in real life, and Sequoia Hax in Second Life (Figure 1). I received a B.A. in Science, Technology, and Society from Stanford University, after which I worked professionally in interactive education and toy design. Currently, I am an M.S. candidate in Environmental Science, Policy, and Management at UC Berkeley. My research explores the interaction between real and virtual worlds for purposes of environmental governance – what I refer to as 'mixed-world environmental governance.' Post-graduation, I hope to combine my professional and academic background in the emerging field of serious games.

Figure 1. Sequoia Hax, my resident in SL.

ABBREVIATIONS

o AAC - Avatar Action Center
o CCX – Chicago Climate Exchange
o CDM – Kyoto Protocol's Clean Development Mechanism
o Ceres – Investors and Environmentalists for Sustainable Prosperity (previously Coalition for Environmentally Responsible Economies)
o EO - Eolus One
o LL – Linden Lab
o RL – real life
o SGI – Serious Games Initiative
o SL – Second Life
o SRI – Socially Responsible Investment

GLOSSARY

o Group – an organization in SL
o Linden dollars or lindens – SL currency, approx L$268 = US$1
o Mixed-world – integration of SL and RL, e.g. a mixed-world event simultaneously occurring in SL and RL, or a mixed-world partnership composed of SL and RL entities
o Mixed-world environmental governance – real-world environmental governance via virtual worlds
o Resident – inhabitant of Second Life
o Sequoia Hax – SL resident representing Stephanie Gerson[1]
o Sim (short for simulator) – a plot of property in Second Life; from what I understand, 1 server generally runs 3-4 sims
    o Governed sim – sim with some form of enforceable/accountable governance

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[1] It may seem awkward to refer to my SL character in third person as Sequoia, but I do so to distinguish between relationships I've formed purely in SL (as Sequoia) vs. those that have migrated into RL (as Stephanie).

INTRODUCTION

Second Life (SL) is an internet-based 3D virtual world developed by Linden Lab (LL) in which users immerse themselves via motional avatars, called residents. As of early-summer 2007, there were between 30-40,000 residents in SL at any given moment, and 507,844 "active" residents, defined as residents who spent more than one hour per month in SL.[2] Tateru Nino, long-time resident and journalist in SL, has projected that active users will total over a million by the end of 2007. What is unique about SL is that the entire world, excepting initial/foundational infrastructure, is created by the residents, and that residents maintain intellectual property rights over their virtual creations. Accordingly, residents construct buildings, design clothing, organize events, and create other such sources of content, but retain property rights for purposes of trade. SL's virtual currency, called Linden dollars, and real-virtual currency exchange, called LindeX, allow residents to not only buy and sell their creations in lindens, but also exchange lindens for real dollars. These features have spawned a thriving market for virtual goods and services, allowing SL to provide viable business opportunities for generating real profit. As of July 31, 2007, $1,186,130 USD have been spent in SL and $230,976 lindens traded on the LindeX during the last 24 hours, and the total supply of lindens is $2,608,448,990.[3] At this magnitude and level of activity, it is clear that virtual and real economies interact, referred to as economy interaction.

Beyond economics, real-virtual interaction occurs to the extent that residents represent real people engaging in SL to socialize, network, collaborate, create things with real value, learn new skills, etc. SL is already being used as an interface for numerous real-world functions, including marketing, reunions, music concerts, job fairs, political campaigning, philanthropy, activism, and – as mentioned above – virtual business. Considering that SL is an information-rich consumer culture, it presents a fertile venue for experimenting with market-based mechanisms of environmental governance. The fact that SL and real life (RL) interact, economically and otherwise, presents added impetus for exploring real-world environmental governance via virtual worlds, or mixed-world environmental governance. The question I'm concerned with is whether and how SL can be leveraged for purposes of real-world market-based environmental governance. Following is an exploration of possibilities in this regard.

Throughout my exploration, I elaborated numerous possibilities for environmental governance via SL (see appendix I). In this report, I expand upon five possibilities that I consider to be most promising in terms of their potential to influence consumer behavior in SL and RL, and as substantiated by my conversations with other SL residents. For example, a Second Life sustainable product market would influence consumer behavior in SL and RL, considering that it would allow SL residents to purchase RL sustainable products, and the SL residents I communicated with were optimistic about this possibility, some of whom are already in the process of developing it (see below). I also consider these five to be the most compatible with the interest of the Serious Games Initiative (SGI) in market-based strategies that influence consumer behavior, and the missions the Woodrow Wilson Center and the EPA. For example, although I consider a campaign to pressure LL into governing its own environmental behavior or a 'Green Brothel' offering carbon-neutral cybersex (see appendix I) to be promising from the

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[2] http://www.secondlife.com - official Linden Lab website and
http://nwn.blogs.com/nwn/2007/06/half_a_million.html - New World Notes blog
[3] http://secondlife.com/whatis/economy_stats.php - official Linden Lab website

standpoint of environmental governance – such that the former could spawn similar developments in other virtual worlds and beyond, and the latter could garner considerable publicity and render cybersex an interface for carbon offsetting – the former relies on activism rather than consumer behavior and the latter is inappropriate for this context. Possibilities not expanded upon in this report are listed below in appendix I. Choosing five possibilities is useful for purposes of focusing on the most promising and experimenting with them in SL, which is intended to happen this fall. If any possibilities in appendix I are appealing, however, I'd be glad to expand upon them further.

FORMAT FOR POSSIBILITIES

This is the format with which possibilities are elaborated below (not all items necessarily included for each possibility):
- Description
- Hypothetical scenario
- Partnerships (potential SL and RL partners)
- Pros/benefits
- Cons/barriers
- Other possibilities (other ideas related to possibility)
- Next steps

POSSIBILITIES EXPLORED

1. Second Life sustainable product market

Description – a Second Life (SL) market for real life (RL) sustainable products would use SL as a 3D interface for e-commerce of RL sustainable products. RL brands/distributors of sustainable products would be able to sell products via SL; residents would be able to purchase products in SL with Linden dollars, and have products delivered to their RL addresses. This market could take the form of permanent structures (i.e. stores) or regularly occurring events (e.g. weekly flea market). It would most likely be successful for consumer goods already popular in SL (e.g. clothing, cosmetics,[4] home furnishings), which maintain the integrity of the SL experience.

Hypothetical scenario – Patagonia sells clothing and gear at the sustainable flea market in SL.

Partnerships
- SL
  - Eolus One (EO), co-founder Eolus McMillan in SL/Oliver Goh in RL – Among other fascinating ventures, EO is developing the integration system for e-commerce via SL (Figure 2). It will allow products to be purchased in SL with Linden dollars and delivered to RL addresses, handling and tracking the backend transaction. According to Eolus,[5] the system will be operational by the first week of August 2007 and freely available to RL firms wanting to do business in SL. An SL market for RL sustainable products would require this system, and thus SGI would partner with EO at least on a logistical level. Further, EO has a shopping area intended for RL sustainable products, and SGI could partner with EO by providing connections to brands/distributors; i.e. EO could provide the venue for a sustainable product market, and SGI could populate it with products. Sequoia is friends with Eolus, has discussed this possibility him, and he's very interested. Also, Oliver is visiting San Francisco in early August, and I may have the chance to meet him in RL.

Figure 2. Eolus One shopping area.

  - Avatar Action Center (AAC), founder Sage Truss in SL/Erika Bjune in RL – The AAC is an SL activist group, committed to educating SL residents about sustainability issues and encouraging them to take action in RL (Figure 3). It educates residents via interactive educational materials like games,

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[4] Cosmetics, or beautifying products, in Second Life are represented as 'skins.'
[5] I refer to Eolus McMillan (co-founder/resident) as Eolus and Eolus One (project/place) as EO.

simulations, presentations, and models, as well as classes, discussions, live speaker events, and weekly activist meetings. It has a shopping platform that is as-yet unrelated to its mission (Figure 4). As with EO, the AAC could provide a venue for a sustainable product market and SGI the products. As with Eolus, Sequoia is friends with Sage, has discussed this possibility with her, and she's very interested. I was first introduced by a mutual friend to Erika Bjune in RL, who lives in San Francisco, so our relationship migrated from offline to offline and we now communicate in both RL and SL.

Figure 3. The Avatar Action Center.

Figure 4. AAC shopping platform.

- <u>Etopia Eco-village, founder WilliamThewise Goodman in SL/Zev Paiss in RL</u> – Etopia Eco-village is an eco-village in SL, showcasing sustainable architecture and other aspects of sustainable living. Etopia has a shopping area intended for RL sustainable products (Figure 5). Again, Etopia could provide the venue and SGI the products. And again, Sequoia is friends with WilliamThewise, has discussed this possibility with him, and he's very interested. He's most interested in sustainable living products, e.g. clothing, home furnishings, and sporting goods. He expressed interest in using coupons for products incompatible with long-distance shipping (e.g. organic food, where residents would receive coupons for purchasing at RL stores

instead of deliveries). Also, I've communicated with Zev in RL for purposes of discussing this possibility. Zev ultimately seeks to develop his business as virtual hosting for brands/distributors of sustainable products, providing the services of virtual property and tech support in SL.

Figure 5. Sequoia and WilliamThewise posing next to a fruit stand in Etopia's shopping area.

- RL
    - Brands/distributors of sustainable products – those which SGI or, more broadly, the Woodrow Wilson Center or Environmental Protection Agency already have relationships with
    - The New American Dream – maintains a comprehensive list of sustainable vendors in various product areas, including food, home/office supplies, personal care, and clothing[6] etc.)
    - Zero Emissions Research and Initiatives (ZERI) – for sustainable products from the developing world[7]
    - Alice Waters, Michael Pollan, representatives of the Slow Food Consortium, or other 'high profile' promoters of sustainable consumption – invite RL personas into SL for sustainable consumption event(s); from a bit of googling, it appears that neither Waters nor Pollan have made appearances in SL

Pros/benefits
- Shopping is already a major activity in SL. As of 11:00am on August 24, 2007, $1,052,743 USD were spent in SL in the last 24 hours. I don't know what percentage of this consists of consumer goods, or goods that have sustainable alternatives, but SL has a robust shopping industry. Meanwhile, the internet is already a major and increasingly growing venue for commerce.
- Potential shopping areas described above are sparse and/or as-yet unrelated to sustainability, thus could benefit from relationships with brands/distributors of socially responsible products.
- The 'infrastructure' is available (or almost available) and potential partners are interested.
- Interest in sustainable products is increasingly growing [insert stats***].
- E-commerce, and especially e-commerce via SL, facilitates information sharing, critical to changing consumer behavior. It would allow consumers to access information on product sustainability at the point of purchase, discuss sustainability criteria, and even develop criteria collaboratively.

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[6] http://www.newdream.org/consumer/index.php
[7] http://www.zeri.org/

Cons/barriers
- RL brands/distributors of sustainable products must be large enough in size/market share to warrant venturing into 3D e-commerce.
- Even if they are large enough, RL brands/distributors may opt for 3D virtual venues other than SL.
- Demand/market size for RL sustainable products via SL?
- What are criteria for product sustainability? Mimic existing directory (e.g. WorldChanging.com), use combination of existing sustainability-oriented certifications (e.g. Fair Trade, organic, and other standards), or elaborate new/SL-specific criteria? For example, WilliamThewise's criterion is whether products adhere to the Lifestyles of Health and Sustainability (LOHAS) model.
- The question of how to make virtual retailing a compelling experience.[8]

Other possibilities
- Prizes for sustainable consumption – residents would receive a pin, sticker, green halo, label, or some other desirable prize for purchasing from an SL sustainable product market. This could involve deals between RL brands/distributors of sustainable products and SL producers, i.e. residents would receive free or get discounts on products made by popular SL fashion designers for making SL sustainable market purchases. This could also render the SL producers involved eligible for Socially Responsible Investment in SL (see below).
- Mixed-world sustainable consumption – allowing residents to purchase both virtual and real counterparts of the same product. For example, WilliamThewise is interested having residents purchase a RL sustainable bicycle which comes with a virtual bicycle for use on Etopia's biking trails.
    - Would virtual counterparts themselves have to be sustainable (e.g. by participating in Green Islands Project; see below)?
    - For which products are residents interested in purchasing virtual counterparts of real products (e.g. real and virtual Patagonia jacket) vs. maintaining separation between real and virtual and real products/identities? Even when the case is the latter, could residents acquire something virtual for their real purchase? For instance, could purely SL fashion designers partner up with RL sustainable clothing brands/distributors to sell real-virtual clothing simultaneously? (This would help identify socially responsible SL firms for Socially Responsible Investment in SL; see below.)
- SL interface as CSA distributor order form – Community Supported Agriculture (CSA) farms may be too small to invest in virtual presence, but CSA consolidator/distributors may be interested in using SL as an interface for their order forms, e.g. as harvesting on a virtual farm. (Note: this would not require shipping; SL would simply be an interface for selecting produce, but residents would still have to pick up items in RL.)
- iBuyRight was the 2006 Master's final project of students at the School of Information at UC Berkeley. It allows consumers to scan bar codes with a cell phone in order to learn social/environmental information about products, enabling them to align consumption choices with personal values. A similar yet virtual tool in SL would allow residents to likewise make value-based consumption choices, whether or not products were sold in an SL sustainable product market.

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[8] http://metaversed.com/11-jul-2007/virtual-retailing-not-ready-prime-time - Nick Wilson of the Metaversed blog describes user interface and associated difficulties with virtual retailing

Next steps
- Ensure integration system/virtual venue availability (at this point, system is nearly ready and 3 venues described above are available)
- Determine demand/market size
- Determine criteria for product sustainability
- Pitch to potential RL partners

2. Emissions/energy offsets via Second Life

Description – SL sims, or more specifically LL servers, emit pollutants/greenhouse gases and require energy to run. It is possible to calculate crudely the emissions/energy costs of an individual sim. An SL emissions/energy offsetting group would allow sim owners to offset the cost of running their sims via RL offset projects (e.g. industrial gas destruction, soil sequestration) or RL credit purchasing (e.g. from the general market). It would employ the Eolus One integration system so that residents could purchase offsets in Linden dollars, facilitating a mixed-world 'paper trail' between the sim owner, SL offsetting group, and RL energy offset project/credit market. Emissions/energy neutrality could be communicated to residents with a logo, which could be an SL-specific certification mechanism (e.g. Green Islands' e-logo, see below), represent a RL certification mechanism (e.g. EPA Energy Star), or be a mixed-world partnership between SL and RL entities. Sim owners could use offsets for reasons similar to RL firms – to fulfill SL or RL corporate greenhouse gas reduction targets, gain emissions/energy market experience, enhance brands and differentiate products (in this case, property), or attract investors in SL or RL.

Hypothetical scenario – An SL carbon offsetting group calculates the carbon cost of Etopia Eco-village, and allows WilliamThewise to offset it by purchasing equivalent credits from the RL carbon market. The group then certifies EE, enabling WilliamThewise to advertise it as carbon-neutral virtual property.

Partnerships
- SL
    - <u>Green Islands Project, co-founder Bjerkel Eerie in SL</u> – Green Islands is an SL group that calculates energy costs of running an SL sim, and charges sim owners the RL cost of purchasing an equivalent quantity of wholesale Green-E ™ renewable energy credits from the Bonneville Environmental Foundation in Portland, Oregon, and then certifies offsetting sims by placing the Green Islands e-logo on their structures (Figure 6). Green Islands operates on 11 sims and isn't listed in the SL classifieds, but advertises itself via word of mouth. Sequoia is friends with Bjerkel, and has discussed the possibility of expanding into carbon/other emissions or other offset projects/credit markets, which she's very interested in. She expressed that her major constraints are difficulties with the SL-to-RL 'paper trail,' which Eolus One would alleviate, and lack of time/human resources, which Sequoia could assist with. A partnership between SGI and Green Islands would offer the former an already-existing SL offsetting project, and the latter additional time/human resources for expanding the project.

Figure 6. Sequoia and Bjerkel posing in front of the Green Islands Zero Energy home, showing the Green Islands e-logo (above) and a demo Energy star hot water tank, which stores hot water during night/overcast periods and acts as a backup for additional hot water production (right).

- HRH Princess, founder ManqoQhapaqInca Qunhua – HRH is an SL activist group committed to sustainability issues and has a large following (relative to most SL groups) of 577 members (Figure 7). Currently, their main current involves corporate disclosure via SL, whereby HRH grants 'Warrants of Appointment' to SL individuals and firms that adhere to the practices advocated at carbonSMS.com, and publicly disclose information on their ecological footprint.[9] Corporate disclosure via SL could be tied to an offsetting scheme, e.g. requiring SL firms to disclose the carbons cost of running their sims. Sequoia is friends with Manqo, has discussed this possibility with her, and she's very interested. As with Bjerkel, Manqo noted that her main constraints are time/human resources. Similarly, a partnership between SGI and HRH would offer the former an already-existing SL corporate disclosure project and the latter additional time/human resources for expanding the project by tying the project to SL offsetting.

Figure 7. Sequoia and Manqo chatting at the HRH Palace.

- Second Chance Trees, co-founder Luna Bliss in SL – Second Chance Trees is a collaboration between Converseon, a social media communications firm, and Plant-It 2020, a non-profit dedicated to planting and maintaining indigenous trees worldwide (Figure 8). Residents pay to plant a virtual tree on Second Chance Trees island in SL, and Plant-It 2020 plants one tree in RL. According to Luna, Second Chance Trees has already had thousands of customers, and draws them via 1) the SL classifieds, 2) Luna's virtual landscaping (residents who like her designs can contact her and learn about Second Chance Trees), and 3) both SL and RL press, which they attracted when Second Chance Trees became a finalist in the American Express Members Project (though it didn't win, the press was considerable). A partnership between SGI and Second Chance Trees could use Second Chance as an SL carbon offset project, sim owners offsetting carbon costs pay to plant the quantity of virtual trees in Second Chance island that would correspond with the offsetting quantity of real trees in RL.

[9] http://carbonsms.com/ - web component of HRH Princess group

Figure 8. Introductory area for Second Chance Trees.

- ▪ Owners of sustainability-oriented sims in SL interested in offsetting emissions/energy costs, examples:
    - Sustainability-oriented SL groups/places (see appendix I; also underlined below)
    - Sustainability-oriented SL/mixed-world events, e.g. Earth Day events, Living Earth concert

- ▪ RL
    - ▪ RL offset projects or markets – those which SGI or, more broadly, the Woodrow Wilson Center or Environmental Protection Agency already have knowledge of/relationships with

Pros/benefits
- Emissions/energy costs of running SL are criticized vis-à-vis sustainability oriented sims in SL, e.g. questioning whether SL is an appropriate venue for earth day events[10]
- Green Islands as proof of concept that offsetting via SL is feasible.
- Residents interested in sustainability in SL are likely interested in it in RL, and thus willing to pay a premium for emissions/energy-neutral property.

Cons/barriers
- Market size/demand for emissions/energy offsets via SL?
- SL offsetting would require a meaningful mixed-world emissions/energy calculator (see appendix I).
- 1 server generally runs 3-4 sims, and LL doesn't disclose which 3-4 sims share the same server. Calculating emissions/energy costs would be easier with this information, and allow server-sharers (vs. sim owners) to more accurately offset server costs. It may be desirable to pressure LL into disclosing this information.

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http://www.secretlair.com/index.php?/clickableculture/entry/open_letter_to_the_second_life_environmental_council/ - open letter to the Second Life Environmental Council on the Clickable Culture blog

Next steps
- Clarify possibilities – what is to be offset: carbon, energy, other emissions? And how is it to be offset: additional offset projects, credit markets, otherwise?
- Determine demand/market size
- Pitch to potential RL partners
- Develop a mixed-world emissions/energy calculator

3. Second Life Climate Exchange

Description – an SL emissions trading scheme similar to SL emissions/energy offsets, but using a formalized cap-and-trade system similar to those in RL, like the CDM and CCX. A cap on emissions would be set, sim owners would be given tradable credits, caps would be adhered to and credits retired via the SL offsetting proposal described above or by deleting unnecessary/redundant virtual items, and penalties for exceeding the cap would be determined. Revenue from penalties could be used strategically. A Second Life Climate Exchange could partner with RL climate exchange and evolve into a mixed-world climate exchange, whereby residents would be able to engage in RL emissions trading using Linden dollars.

Hypothetical scenario – An SL carbon offsetting group works with Etopia Eco-village to offset its carbon cost with reforestation via Second Chance Trees. Being carbon-neutral, Etopia sells its carbon credits to the Second Life Climate Exchange; being carbon-intensive (in SL and/or RL), IBM buys emissions credits from the Second Life Climate Exchange.

Partnerships
- SL
    - Green Islands Project, co-founder Bjerkel Eerie in SL – Sequoia has discussed this possibility with Bjerkel, and she's very interested.
    - Sustainability-oriented SL/mixed-world groups/events/places (see above).
    - Chili Carson in SL/Arlene Ciroula in RL – founder of KAWG&F, the first Certified Public Accountants firm in SL (Figure 9). She provides SL business consulting and has attempted to create an SL chamber of commerce. Sequoia is friends with Chili and I've communicated with Arlene in RL, and she's willing to provide expertise on the SL economic landscape for purposes of exploring this possibility.

Figure 9. Sequoia and Chili chatting in the KAWG&F office.

    - Beyers Sellers in SL/Robert Bloomfield in RL – professor of accounting at Cornell University and Director of the Business Simulation Laboratory, currently doing research on the SL economy. Sequoia is friends with Beyers and I've communicated with Robert in RL, and he's also willing to provide expertise.
    - SL stock exchanges and other relevant financial groups – e.g. the World Stock Exchange, SL Business Bureau
- RL
    - RL entities already participating in RL cap and trade systems and with SL presence.

Pros/benefits
- Offsetting would be encouraged beyond that which would be achieved by the SL offsetting program described above.
- Good opportunity for regulators to experiment with a carbon cap-and-trade program.

Cons/barriers
- Demand for emissions trading in SL?
- An SL Climate Exchange would require regulatory mechanisms in order to enforce the cap and hold those who exceed it accountable, and SL is notoriously contentious vis-à-vis regulation. However, the exchange could simply require transparency to participate or operate solely on governed sims (see below).
- This idea does not yet exist in SL, and would have to be developed, potentially requiring building/scripting.
- This idea would require a meaningful mixed-world emissions/energy calculator.

Other possibilities
- As suggested by Beyers Sellers, cap and trade of emissions/energy-intensive virtual items, e.g. prims, scripts, animations. This would be more of an educational initiative, allowing residents to experience cap and trade, but it would offset the cost of virtual items while retiring (i.e. deleting) those that are redundant/unnecessary. Or, as suggested above, this could be combined with a cap and trade scheme as a mechanism for offsetting emissions/energy costs. It might be interesting to determine the amount of server space dedicated to redundant/unnecessary virtual items.

Next steps
- Determine what is to be traded – carbon (metric tons), energy (kWh), other emissions?
- Determine demand/market size
- Pitch to potential SL and RL partners
- Develop an emissions/energy calculator

4. Socially Responsible Investment via Second Life

Description – introducing Socially Responsible Investment (SRI) into SL, which would entail setting up an SRI fund or socially responsible stock exchange in SL to invest in socially responsible firms. SRI via SL could manifest itself in multiple ways:
- Investing in socially responsible SL firms (e.g. firms which offset emissions/energy costs via Green Islands, are co-operatively owned, give philanthropically to socially responsible initiatives in SL or RL)
- Investing in SL counterparts of socially responsible RL firms (e.g. SL counterpart of RL firm American Apparel)
- Venture capital for SL firms that seek to be socially responsible in SL/RL

Hypothetical scenario – Residents use Second Life Socially Responsible Investment fund to invest in a portfolio of socially responsible mixed-world firms, including Etopia Eco-village and American Apparel, thus promoting mixed-world social responsibility via SL.

Partnerships
- SL
    - WilliamThewise Goodman in SL/Zev Paiss in RL – Etopia Eco-village is already listed on SL's World Stock Exchange, and WilliamThewise has expressed interest in exploring this idea.
    - Chili Carson in SL/Arlene Ciroula in RL – again, willing to offer expertise
    - Beyers Sellers in SL/Robert Bloomfield in RL – again, willing to offer expertise
    - SL stock exchanges and other relevant financial groups – e.g. the World Stock Exchange, SL Business Bureau
- RL
    - RL SRI investors/funds/exchanges interested in SL presence

Pros/benefits
- Much of the financial infrastructure already exists, e.g. banks, investment funds, stock exchanges.
- SL firms are de facto public, i.e. available for investment.

Cons/barriers
- Buyers Sellers/Robert Bloomfield organized a panel on SL stock exchanges on July 17, 2007[11], at which panelists reported success and reported a low fraud rate of 15% (Figure 10). Only 10 later, however, information leaked that someone had hacked into the banking account for the World Stock Exchange (largest stock exchange in SL).[12] As with an SL Climate Exchange, therefore, SRI via SL would require better articulated regulatory mechanisms than are currently in place, which could similarly be enforced by requiring transparency to participate or operating only on governed sims (see below).

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[11] http://metaversed.com/robert-bloomfield/blog/16-jul-2007/second-life-financial-markets-panel-smashing-success - Metaversed blog entry and comments on the panel by moderator Robert Bloomfield and notorious SL persona Prokofy Neva
[12] http://terranova.blogs.com/terra_nova/2007/07/financial-marke.html - Robert Bloomfield's post on the scandal on the TerraNova blog, with links to his posts on the Metaversed blog

Figure 10. Panel on SL stock exchanges, organized by Beyers Sellers (sitting, far left).

- According to personal communication with Robert Bloomfield, listing firms have raised $400M lindens ($1.5M USD) through SL stock exchanges. This sum may be too small to attract real-world firms/investors.
- What are criteria for social responsibility? Use existing SRI criteria/metrics (e.g. CERES principles), use a combination of existing, or elaborate new/SL-specific ones?
- Market size/demand and return on investment for SRI in SL?

Next steps
- Clarify the meaning of SRI via SL
- Determine criteria for social responsibility
- Determine demand/market size and potential return on investment – would this be attractive only to SL firms, or also RL ones?
- Pitch to potential SL and RL partners

5. Sustainable Second Life sim

Description – an entire sim in SL dedicated to sustainability via the ideas described above. All the products sold in the region would be sustainable; the sim would offset its emissions/energy costs; host the SL cap and trade system; and it would be a governed sim, enforcing regulation to facilitate cap and trade and SRI. The sustainable sim could be the SGI's headquarters in SL.

Hypothetical scenario – A sustainable sim would allow residents to engage in SL sustainably, and promote RL sustainability via SL. Residents interested in RL sustainability would live in the sim or visit it to go shopping, engage in SRI, or otherwise explore possibilities of mixed-world sustainability.

Partnerships (besides those listed above)
- SL
    - Green Islands and Etopia are both seeking to expand into larger/additional islands, and might be interested in this larger-scale idea.
    - Governed sims such as Neufreisdadt, "an administrative region of an over-arching government in SL, called Confederation of Democratic Simulators (CDS)…[in which] citizens can influence nearly every aspect of the sim's administration."[13]
    - Ashcroft Burnham – a practicing member of English Bar in London who is very knowledgeable about SL governance issues and vocal about them in both SL and RL, and may be able to provide expertise.
    - Prokofy Neva – notorious critic of LL and advocate of self-governance in SL; involving Neva would certainly attract attention[14]
- RL
    - The serious games community, EPA, environmental NGOs, academics

Pros/benefits
- Centralized hub for testing/exploring mixed-world sustainability.

Cons/barriers
- A sustainable sim would require purchasing land and building structures.
- This sim would need to attract residents, competing with other potentially more compelling places.

Other possibilities
- Sustainable sim as experimental testing ground for market-based mechanisms of environmental governance; partner with academics in this field

Next steps
- Determine demand/market size/resident interest in a sustainable sim
- Pitch to potential SL and RL partners
- Purchase land, build structures

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[13] http://www.slhistory.org/index.php/Neufreistadt - description of Neufreistadt from the SL History Wiki

[14] http://secondlife.blogs.com/nwn/2005/06/feted_inner_cho.html - description of Prokofy Neva on New World Notes blog

CONCLUDING THOUGHTS

A few brief thoughts on prospects for environmental governance via Second Life: The emissions/energy cost of SL is considerable. Business writer and blogger Nicholas Carr estimates the daily SL energy use as 60,000 kilowatt-hours, which translates into a per capita consumption of 4.8 kWh per capita per day, and 1,752 kWh per year. [15] This is comparable to the average RL Brazilian consumption of 1,884 kWh per year, allowing Carr to conclude that an average resident in SL consumes approximately as much energy as an average Brazilian in RL. (Note: this conclusion doesn't account for the distribution of energy consumption.) Despite the magnitude of SL's emissions/energy cost, I consider it imperative to move SGI's SL initiatives beyond SL cost alone. For example, if the SL offsetting project proposed above partnered with RL offsetting projects/markets, it could introduce residents to the mechanics offsetting and allow them to offset SL costs *while* encouraging and working with the real-life counterparts of SL residents to offset their RL costs. In my opinion, if SL doesn't provide 'added value' to market-based mechanisms for environmental governance, they will be pursued via RL channels instead. And if SGI doesn't move beyond SL costs, it will remain somewhat limited. Accordingly, it is the mixed-world element that will allow SGI to serve as an virtual incubator for RL environmental governance.

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[15] http://www.roughtype.com/archives/2006/12/avatars_consume.php (this estimate was made in December of 2006 and has likely increased since)

APPENDIX I: Additional ideas

Note: proceeds from any of the following could be donated/invested in an environmentally responsible way, or somehow support environmental governance initiatives in SL.

Specific projects
- Environmental tour of SL – a tour of environmental-related sites in SL. Participants could travel on virtual vehicles using different fuels with different energy efficiencies, and learn by comparing and contrasting their energy costs.
- Environmental/sustainable directory of SL – a directory of sustainable SL/mixed-world firms in SL (e.g. Etopia Eco-village, American Apparel).
- Incorporating resident RL energy usage in sustainability of SL products – using a mixed-world energy calculator e.g. if a fashion designer in SL uses only solar power in RL, can her designs be characterized as sustainable in SL, and therefore sold in the sustainable products market described above?
- SimEarth-type region in SL – allowing residents to engage in restoration ecology, Superfund bioremediation, sustainable agriculture, etc. Note: this would be different from existing SimEarth-type games because it would be entirely user-created and ideally involve collaboration between different epistemic communities and ways of knowing.
- Greenhouse restaurant – residents harvest organic ingredients and give them to the 'iron chef' who concocts (builds) a delicious meal on the fly. The restaurant itself would be sustainable, e.g. offsetting its energy costs via Green Islands, and could be an interface for 3D e-commerce of sustainably-grown food. (I've elaborated this idea considerably and would like to pursue it regardless of my academic work, but it may be suitable for an SGI lounge/gathering space.)
- Mixed-world emissions/energy calculator – allowing residents to calculate RL emissions/energy costs of their SL activities.
- Environmental governance of Linden Lab – organizing a campaign to pressure LL into offsetting its own emissions/energy costs, engaging in emissions trading, and/or sourcing some of its energy sustainably.
- Currency disparity alleviation - Residents from countries with stronger currencies are at an advantage to those from countries with weaker currencies vis-à-vis purchasing Linden dollars. If deemed just, a campaign could be organized to pressure LL into introducing some sliding scale mechanism to alleviate this disparity.
- Green brothel – this sim offset its emissions/energy costs via Green Islands or otherwise, thus offering emissions/energy-neutral cybersex. Although sexual activity is prevalent in SL, it is not so much the emissions/energy it would offset as the publicity it would attract that makes this possibility interesting.
- Inventory cleansing services – cleaning residents' inventories to delete unused items. The environmental value of this is similar to that of cap and trade with emissions/energy-intensive virtual items (see Second Life Climate Exchange above), considering that virtual items make emissions and require energy to exist.

<u>General ideas</u>
- Mixed-world environmental advocacy – SL could provide the virtual venue for RL environmental campaigns, such that RL activists/organizations use it for purposes of organizing, disseminating information, etc. If it were possible to address SL-RL identity issues, it might be possible to sign RL petitions or cast RL votes via SL.
- Mixed world events – SGI, the Woodrow Wilson Center, and the EPA could host their RL public environmental governance-related events simultaneously in SL, allowing for a broader and more interactive audience. For example, the Serious Games Conference could take place in both RL and SL simultaneously.
- Partnerships with famous SL/RL personas – for purposes of any environmental governance initiatives pursued in SL, it may be fruitful to partner with SL residents who have political leverage, such as major scripters (e.g. Electronic Sheep Company), financial elite (e.g. Anshe Chung), famous SL personas (e.g. Ian Ha), famous RW personas (e.g. Duran Duran), or famous SL-RW personas (e.g. Hamlet Au).
- Environment-related cultural events in SL – e.g. environmental film festivals (machinima or RL films), lectures, interviews, concerts, etc.
- Environment-related media – e.g. environment-related articles for SL publications.

APPENDIX II: SL groups/places with potential interest in offsetting emissions/energy

o ABC ECO House – virtual demo of sustainable living
o Avatar Action Center – activist group committed to educating SL residents about sustainability issues and encouraging them to take action in RL
o Better World Island – island representing the Omidyar Network, a social progress organization established by eBay founder Pierre Omidyar
o Commonwealth Island – island hosting social justic and environmental organizations, run by EnviroLink
o Ecopolis – virtual demo of sustainable living
o Eolus One – mixed world think tank dedicated to addressing RL sustainability issues such as energy management and commerce via SL by developing RL-SL integration systems
o Etopia Eco-village – virtual demo of sustainable living
o OneClimate Living – virtual demo of sustainable living
o Second Chance Trees – mixed world partnership whereby SL residents pay to plant a virtual tree in SL, and a corresponding tree is planted in RL

APPENDIX III: other relevant SL groups/places

• SciLands – SL region for science and technology organizations interested in using SL for education and other serious applications.[16] It was founded in January of 2007 and already hosts 34 islands and members, including academics, government agencies, libraries, museums, subject matter experts, and educational technology researchers, and addressing issues such as public health, space travel, and nanotechnology. For example, the Imperial College of London and the National Physical Laboratory (UK) are collaborating on Second Health, a virtual hospital testing the effectiveness of SL for conveying healthcare information to caregivers, doctors, and the public. Considering the other groups and projects emerging in SciLands and possibilities for networking and collaboration, SciLands may be an ideal location for a Serious Games Initiative or EPA headquarters. Sequoia is in touch with Davee Commerce/Dave Taylor, who leads Second Health and Nanotechnology Island in SL, and is the new media development manager for the National Physical Laboratory in RL.
• Real life government in second life – SL group designed to assist in bringing government agencies into virtual worlds. Current agencies include the Centers for Disease Control and Prevention, the Library of Congress, and the Department of Trade and Industry (UK). If the EPA were to seek SL presence, the services of this group may be useful. Sequoia is in touch with Hacshaven Harford/Eric Hackathorn, owner of this group in SL, and CEO of Maya Realities (start-up elaborating metrics for the 3-D web) and IT Specialist at National Oceanic and Atmospheric Administration in RL.

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[16] SciLands blog at http://scilands.wordpress.com/blog/, and a detailed write-up on SciLands can be found on the UgoTrade blog at http://www.ugotrade.com/2007/08/30/second-health-and-the-scilands/.

APPENDIX IV: Suggested readings

Books/articles
- Castronova, Edward. "On Virtual Economies." Game Studies. December 2003. Volume 3, issue 2. <http://www.gamestudies.org/0302/castronova/>
- Castronova, Edward. *Synthetic Worlds: The Business and Culture of Online Games.* The University of Chicago Press. October 15, 2006.
- Dibbell, Julian. "The Unreal Estate Boom." Wired Magazine. January 2003. Issue 11.01. <http://www.wired.com/wired/archive/11.01/gaming.html>
- Grimmelmann, James. "Virtual Borders: The Interdependence between Real and Virtual Worlds." First Monday. February 2006. Volume 11, number 2. <http://www.firstmonday.org/issues/issue11_2/grimmelmann/>
- Thompson, Clive. "Game Theories." Walrus Magazine. June 2004. <http://www.walrusmagazine.com/print/2004.06-economics-game-theories/>
- Ward, Stephanie. "Fantasy Life, Real Law." ABA Journal. March 2007. <http://www.abajournal.com/magazine/fantasy_life_real_law/>

Blogs/listservs
- Metaversed <http://metaversed.com/> - Nick Wilson's blog on virtual world business and technology
- New World Notes <http://nwn.blogs.com/nwn/> - well-known SL and RL journalist Wagner James Au's blog on Second Life
- Official Linden Blog <http://blog.secondlife.com/> - Linden Lab's official blog
- Serious Games Discussion Listserv <http://www.seriousgames.org/maillist2.html> - Serious Games Initiative's listserv on serious games
- Terra Nova <http://terranova.blogs.com/terra_nova/> - blog about virtual worlds