

4. STRONG SOCIAL TIES Each of the three EVI neighborhoods are NYS housing cooperatives, based on “Cohousing”, with shared common facilities, and many shared social events, including several community meals a week. Residents love living at EVI.

5. LOCAL FOOD PRODUCTION Two resident-owned farms supply organic fruits and vegetables to 1,500 county residents during the growing season.

6. ON-SITE BUSINESSES Almost half (45%) of wage-earning residents work or telecommute from home offices, or provide services for neighbors, lessening the need for commuting.

7. EXTENSIVE COMPOSTING, RECYCLING AND RE-USE Residents compost all non-meat kitchen scraps, and have cut need for garbage services by 75%.

8. AFFORDABLE, ACCESSIBLE TREE, the new neighborhood, has plans to build as affordably as possible, while also planning for aging in place.

9. OPEN SPACE PRESERVATION EVI preserves 90% land for agriculture, natural meadows, forests and ponds.

10. HANDS ON EDUCATION EVI-CSE works closely with Ithaca College and provides at least one accredited course per semester on the topic of community sustainability. The partnership has increasingly spent time in cultivating partnerships with downtown communities, and provides cultural competency trainings to I.C. professors and students. EVI-CSE provides tours for about 1,000 visitors a year, and currently has two robust educational programs – Groundswell Center for Local Food & Farming, and EPA Climate Showcase Communities.

Public Recognition & Appeal: From its inception, EcoVillage at Ithaca has enjoyed great recognition as an integrated model of environmental and social sustainability. It has received local, national and international awards, and has been consistently covered by major national and international media. This overall public appeal is based on how well these best practices work together to create a deeply satisfying way of life, one that speaks to the need for both social connection and connection with nature.

Historical Overview of EcoVillage at Ithaca: Vision to reality:

EcoVillage at Ithaca began in 1991, the brainchild of Joan Bokaer, a teacher and grassroots organizer. The year before, Joan had organized a walk across the U.S. from Los Angeles to New York City, to reach out to people about environmental issues. I helped Joan organize this walk of 150 people from six different countries, and became its organizational manager – trouble-shooting, cajoling, and making sure the daily work got done by well-oiled teams and committees. The Global Walk for a Livable World, as it was called, was transformational for those of us who took part, and we touched the lives of tens of thousands of people in the 200 communities where we stopped, planted trees, gave talks, started recycling programs and held media events. It was a rich experience of simplifying our lives of material goods, yet simultaneously experiencing the complexity of living in community with all the joys and struggles that entailed. It was excellent training, in fact, for undertaking the development of a pioneering environmental community like EcoVillage at Ithaca. One young woman spoke for all of us at the end of the walk. She said, “Now that I’ve walked across the country, I know I can do anything.”

After the Walk was over, Joan returned to her home community of Ithaca, NY and began to further develop the concept of an ecovillage, which had first emerged on our long cross-country trek. She invited me to join her in organizing the village. In June, 1991, we held an “Envisioning Retreat” which brought together about 100 people from around the country, as well as locally. This Envisioning Retreat adopted and augmented the basic concepts that Joan had laid out: a pedestrian village for 500 people, made up of cohousing communities, with lots of open space and organic farms, and ongoing educational opportunities. This five day retreat led to a critical mass of people who were excited by the vision, and empowered to bring it to life.

Joan and I raised money to start a small non-profit organization, and became its co-directors. We worked with the non-profit Center for Religion, Ethics and Social Policy at Cornell¹ as a fiscal sponsor.

Land Purchase:

We began by securing land. After searching for developable parcels that included good farm-land, we chose a 176² acre parcel that had been slated for a subdivision before the developer went bankrupt. In the planned development, 10% of the land had been set aside for open space, and 150 homes were scheduled to be built on one acre plots, thus using the remaining 90% for buildings, roads and yards. We decided to turn around this paradigm of typical U.S. development by taking the same piece of land and setting aside 90% of the land as open space, while densely clustering the housing (100 homes) on just 10% of the land.

Joan and I raised \$400,000, primarily in loans, from friendly investors around the country in a matter of weeks. The legal structure took months to figure out, however. A structured mortgage pool of 9 investors was created, with one individual mortgage on an adjacent parcel. We closed on the land on the summer solstice, June 21, 1992, just a year after the Envisioning Retreat.



Land Use Contrast: In this Envisioning Plan, 90% of the entire site is set aside for farms, woods, ponds and meadows, with just 10% for 100 homes, Common Houses, and parking. The prior developer's plan called for 90% of the site for developing 150 homes, with just 10% open space – a typical suburban subdivision.

At that time we had no idea how difficult it could be to repay these loans. Fast forward five to ten years: The initial timeline for building five cohousing neighborhoods in 10 years time proved to be hopelessly unrealistic,

¹ CRESA later changed its name to the current Center for Transformative Action.

www.centerfortransformativeaction.org

² We later sold off one acre for residential development to help pay off the mortgage on the land, leaving 175 acres.

and the first neighborhood ended up building infrastructure for the future village, but could not also afford to pay for land. For years our non-profit struggled under the weight of the debt that could only be repaid from future neighborhood development. As a sign of just how committed those early investors were to the project, over half of the loans were forgiven (including one \$130,000 loan by a resident couple!), enabling us to raise enough money through the development of the second neighborhood, and numerous small donations, to pay off the land in its entirety by 2003.

First Neighborhood:

Once the land was purchased we started organizing the first resident group (frg), affectionately known as "FROG," in the summer of 1992. Working with local architect and builder Jerold Weisburd and his wife, Claudia, the budding cohousing group spent four and a half years of intensive meetings to plan the neighborhood, go through a grueling town approval process, and build the thirty homes and 5,000 square foot Common House. To finance the project, each resident household paid 20% down, and the group secured a construction loan from a local bank, Tompkins Trust Company, for the remaining 80%.

In November, 1996, in the midst of the building process, when half of the homes were finished (with eight occupied), and another half were underway, a major construction fire broke out. In one of the largest fires in the history of Ithaca, flames shot 60' high, and demolished 8 houses, the Common House, and damaged six other homes. It was terrifying! Luckily the Ithaca Fire Department and five volunteer fire departments from nearby towns came to the rescue, and the rest of the neighborhood was saved. Also, we were lucky that builder's risk insurance covered the cost of rebuilding all of the damaged homes. FROG was rebuilt, and a celebration was held in the new Common House in August, 1997.



FROG Common House, a community center serving 30 households, with common laundry, dining and kitchen facilities, play areas, living room, and 8 "home" offices.

Second Neighborhood:

Next came the second neighborhood group, or "SONG." As Executive Director of the non-profit³, I was highly motivated to start organizing this neighborhood to help pay off the pressing land debt, as well as to fulfill our mission of developing multiple cohousing neighborhoods. I convened an initial meeting on Labor Day, September, 1996, just a month before the first families moved into FROG, and two and a half months before the terrible fire.

The forming SONG group had a very strong interest in building as affordably as possible. Together with Rod Lambert, a fellow FROG resident and builder, I researched options for working with local affordable housing agencies. Unfortunately we found that EVI land, just two and a half miles from downtown Ithaca (and half a mile from the city limits), was too rural to receive federal HUD funding, and too urban to receive USDA

³ Joan left her job with EcoVillage in 1996, and I became the sole full-time staff person.

funding – a typical suburban conundrum. After trying multiple strategies to achieve affordable housing, the group splintered and fell apart. Only three families remained.

Thanks to a no-interest loan of \$100,000 from Equity Trust, a community-land trust organization, we were able to get SONG back on its feet, and in 2001 the first homes were built. We didn't have enough households to create a full 30 unit neighborhood, so we split the project into two phases: "SONG, Verse 1," with 14 homes and "Verse 2," with 16 homes, for a total build-out of 30 homes by 2004. The Common House was built in 2005-2006. We also worked with Better Housing for Tompkins County to apply for Federal Home Loan funds, and with the \$112,000 grant we received, we were able to subsidize the down payments on six units, made available for families who earned 50-80% of the area median income. SONG thus was able to set aside 20% of its homes as affordable housing.

Third Neighborhood:

Now TREE (third residential ecovillage experience) is underway. For the third time I found myself organizing a cohousing neighborhood – this time in 2007. By this time the land had been paid off, but our mission still called for a larger village. There was also a growing need for more accessible housing, as our residents wanted to "age in place," and a desire for more affordable housing. In addition, there were new green building technologies that seemed well-worth demonstrating. At the same time, just as with the development of SONG, there were some residents who wanted no further change, and thought it was a mistake to develop another neighborhood. This made it very hard to reach consensus as a village on some key agreements about cost-sharing for land and infrastructure, and future site planning. However, over time, these conflicts have diminished.

TREE has experienced its own growing pains, despite learning from the experiences of both FROG and SONG. TREE decided to hire the same architect, Jerry Weisburd, who had designed and built FROG more than a decade earlier, although he now lived in California. This long-distance relationship has meant substantial teleconferencing, and using file-sharing programs such as Drop-Box. Weisburd was very familiar with our project, and residents were happily living in homes that he had designed and built, so there was a clear track record. TREE decided to use the same kind of standardized design as FROG, thus lowering costs, and used some of the same charming, winding, European street design as FROG, while selecting a middle range of spacing between the houses compared to the other neighborhoods.



Architect Jerold Weisburd's sketch of the TREE neighborhood, showing the four-story Common House in the center, with winding pedestrian streets leading past homes with solar panels.

A regional builder was selected who could be involved early on in the design stage in 2010, but unfortunately this relationship did not work out. TREE searched for, and found a new builder, Lecesse Construction from Rochester, NY. Lecesse was chosen for their experience with multi-family housing, some green building, excellent references, and a maximum price contract. In this type of contract, the builder guarantees not to exceed a pre-set maximum price. If there are savings, they are returned to the owner.

However, there was a big discrepancy between pricing based on the architect's estimates in early 2010, and the newly selected builder's estimates a year later. This led to a crisis when anticipated pricing rose by almost 50% in January, 2011. Eight of the 30 families assembled dropped out at this point, even as the group worked hard to problem-solve, and added 10 more units to the plans in order to bring prices back to a more reasonable level. The Common House was redesigned to include 15 flats, duplexes were added, and the site design was adjusted. These changes led to having to go back to the Town of Ithaca for amendments to the zoning, as well as re-applying for preliminary and final site plan approvals, all of which took an additional several months. Meanwhile another seven households dropped out, mostly due to the lingering recession which made it difficult to relocate. People had trouble selling homes around the country and finding new jobs in Ithaca. However, others joined. As I write this report, there are 33 committed households out of 40, in January, 2012. Interestingly, TREE is predominantly an older group, with many singles and couples who are retired or close to it. These are people who do not need to find work, and are therefore more mobile in a recession.

Farming at EcoVillage:

While the three neighborhoods required a lot of labor, other important developments were occurring simultaneously. In 1992, Jen and John Bokaer-Smith started West Haven Farm, which has grown over the years from a 3 acre Community Supported Agriculture (CSA) operation to a current operation of 10 acres which currently feeds about 1,000 people a week during the growing season. The farm, which is certified organic by the Northeast Organic Farm Association (NOFA), grows 250 varieties of vegetables, some fruits, flowers and herbs. West Haven Farm has a very popular stand at the Ithaca Farmer's Market on Saturdays, in addition to having 250 shareholders in the CSA. There are plans to further expand the farm to 22 acres in the near future, to allow more land to lie fallow between plantings, as well as to expand the existing orchard.

Another successful on-site farm is Kestel's Perch Berries, a no-pesticide, five acre U-Pick farm with six kinds of berries. Katie Creeger, like the Bokaer-Smiths, lives at the EcoVillage. Her farm is also set up as a CSA, and attracts customers from around the area. Both farms lease land from the non-profit for the cost of the taxes paid on the land.



West Haven Farm's greenhouse is a great place to start seedlings.

Sustainability Education:

Meanwhile, the educational, non-profit side of EVI has carried out a variety of programs, including: co-organizing major conferences, hosting a year-long speaker's series on sustainable living, developing a partnership with the Environmental Studies Department of Ithaca College (under the auspices of a three-year National Science Foundation grant), working with low-income, inner-city children, developing a sister-village relationship with Yoff, (a village in Senegal), giving presentations around the country – the list goes on.

Current educational activities center on teaching young people important food and farming skills through Groundswell Center for Local Food and Farming www.groundswellcenter.org , applying lessons learned to residential development through the Climate Showcase Communities grant (in collaboration with Tompkins County Planning Department), and ongoing collaborative courses, and faculty development through our Partnership for Sustainability Education with Ithaca College. In addition, we write books, enjoy ongoing national and international media attention, and host tours for visitors from around the world.



Groundswell beginning farmer training students on their way to working at West Haven Farm.

Principles: Guidelines for Development

In 1992, when we first purchased the land for developing EVI, we pulled together a committee to create a Comprehensive Plan for long-term land use and development. Working with a couple of local architects, various Cornell faculty and students, as well as future EcoVillage residents, we adopted a very participatory strategy. Between September, 1992 to March 1993, we held four Land Use Planning Forums. A total of about 100 people participated over the course of nine months. Forums ranged from 60 people working together for an entire weekend, to a final session of just 12 people for an afternoon. Together we identified goals and objectives for the following categories:

- a) residential neighborhoods
- b) agriculture
- c) transportation and circulation
- d) energy
- e) water and wastewater
- f) natural resources and recreation
- g) solid waste
- h) building materials
- i) social
- j) village center complex
- k) visitor's center
- l) EcoVillage Education and Research Center

The "Guidelines for Development" emerged as a compilation of these planning forums, and a document was approved by the EVI Board of Directors on October 7, 1993. These Guidelines have proven to be an important touch-stone, and set a high standard for both social and environmental sustainability. They have been used as a reference or adopted by several other eco-communities around the country as well. The planning process was also the subject of a Cornell dual Master's thesis in Landscape Architecture and City and Regional Planning.

Site Planning Process:

At the same time as the Guidelines for Development, a proposed site plan was developed, using the same participatory methods. The site plan showed five 30-unit neighborhoods clustered around a village green, all on just 10 acres of land. When the first neighborhood was developed, it was found that this level of density (150 homes, roads, and parking on 10 acres) was not considered practical or desirable, and the first neighborhood was sited further south, on a south facing slope with remarkable views and excellent solar exposure.

The second and third neighborhood placement each took considerable discussion by the existing village and the EVI non-profit Board of Directors. The final site plan clusters the three neighborhoods in a triangle with a Village Green in the center. The Village Green is designed to be a pedestrian-oriented gathering space that includes a picnic area, a small pond, a day-lighted stream, beautiful southern views, an eventual gazebo, and more. It will provide a larger outdoor gathering space than currently exists, so the entire village can come together for events.

Since that time, the Guidelines for Development and the overall Site Plan have been revisited several times briefly, but once in-depth in a village-wide "Programming and Site Planning Workshop" conducted by Greg Ramsey, an architect with Village Habitat Design. The goal of the four day workshop from September 22-26, 2005, was to develop a program and site plan for potential future growth of the village (this pre-dated TREE.) During the six months leading up to the workshop, a number of teams of residents did preliminary research and analysis. These teams were then joined by other residents and guests during the workshop itself. These teams focused on areas including:

- a) Village Connections
- b) Green Infrastructure
- c) Housing
- d) Work Places
- e) Education/ Village Center

While an enormous amount of work went into preparing for and participating in the workshop by the teams, the Village and the architect, the process was too compressed to yield a true consensus on the final site plan. There was discomfort expressed by some that the proposed Site Plan had too much of the architect's goals, and not enough of the Village's wishes. Specifically, the architect advocated for some live/work housing that was not associated with any cohousing neighborhood, while many villagers thought that all housing should be an integral part of a neighborhood community.

However, quite a lot of good ideas emerged over the course of the workshop, and there was agreement reached on placement of a third neighborhood and an eventual Education Center/Village Center. There was also acknowledgement of a desire for housing that was more affordable, more accessible, and that further reduced the ecological footprint of residents. These ideas have in fact been a primary driver in the establishment of TREE, the third EVI neighborhood.

Cohousing Neighborhood Development: Choices Made

In all three neighborhoods, marketing was (is) primarily through word of mouth, website, and extensive national media coverage. Each neighborhood has attracted about one third of its members locally and two thirds from around the country. This is quite unusual, and attests to the appeal of the "big vision" of EcoVillage at Ithaca.

Potential residents go through a comprehensive membership process in which they are invited to multiple meetings, visits, and an orientation session. However, rather than going through a selection process, newcomers are invited to ascertain for themselves whether they share the values and the interest in living at EVI.

FROG: As the first cohousing neighborhood in NYS, FROG chose to concentrate on "getting it built," while doing its best to meet twin goals of affordability and green building. FROG worked closely with local

architect/builder Jerold Weisburd, to choose an architectural program that included super-insulated, passive solar homes, clustered densely around a pedestrian street, with cars parked on the periphery of the neighborhood. Since FROG was among the first dozen cohousing neighborhoods built in the U.S., site and building designs were primarily inspired by existing Danish cohousing examples. While four sizes of homes were accommodated, ranging from 900 square feet to 1650 square feet, they all shared the same basic design, including kitchens and baths. This standardization led to very economical construction. Savings went into purchasing excellent windows (triple-paned Accura Dorwin, from Winnipeg), and attractive features like cathedral ceilings, 14' high window walls on the south side (for maximum solar gain and day-lighting), solid maple countertops and sills, and large, open mezzanines overlooking the living room. During the course of developing the designs, a fifth design was introduced to accommodate wheelchair accessibility, with a full bath and bedroom on the ground floor. Three of these accessible units were built due to resident demand.

All homes and the Common House are wood-frame construction, with double walls, and an interior vapor barrier. All utilities are inside the vapor barrier, which horizontal furring strips hold in place. Walls are filled with blown-in dense pack cellulose insulation (recycled newspaper). All homes are duplexes, which are grouped in four south-facing clusters. All homes have crawl-spaces, and are linked by pipe chases to one of four "Energy Centers" which contain central natural gas-fired boilers that heat hot water (for back-up space heating and domestic hot water) for homes on an on-demand basis. The energy centers allow for a type of district heating, in which each cluster of six to eight units share the hot water, and there is only one utility hook-up, thus saving thousands of dollars in meter charges annually for the neighborhood. Energy use is sub-metered, and billed by the Cooperative on a per household usage basis. This system takes all of the combustion out of the homes, contributing to excellent indoor air quality. It also has the advantage of allowing the neighborhood to easily retrofit to a renewable fuel system in the future, by only changing the fuel source of the four energy centers.



This birds-eye view of the FROG, shows clusters of homes facing a pedestrian street, with the Common House at one end. Drawing by Jerold Wiesburd, architect and builder.

Gregory Thomas, a former resident of FROG and founder and CEO of Performance Systems, which does energy efficiency consulting on a national basis, estimates that the passive solar orientation of buildings in FROG leads to approximately 30% in energy savings.

After fifteen years, homes are in good shape. Energy Center boilers have been replaced by newer, more efficient models. The cedar siding and oriented strand board (OSB) have had to be re-stained several times.

Between the solar gain, and the super-insulation, the energy bills are quite low – one typical three bedroom unit only pays \$1130/year for heat, hot water and electricity for instance. In contrast, the typical U.S. family spends about \$1,900 a year on home utility bills.⁴ This is a savings of about 40% a year!

SONG: As the second neighborhood group (SNG, or “SONG”) at EVI, SONG residents learned from some of the processes of the FROG, but also made many of their own choices. An early decision made was to spread the houses further apart than FROG in the site plan. This has led to a noticeable difference in interior space between the two neighborhoods. There is more gathering space for children to play, and for neighbors to hang out together. At the same time, the spacing cuts down on some of the natural daily interactions between neighbors across the street. Visitors often compare FROG to a European village, and SONG to a more typical U.S. suburban neighborhood. Interestingly, about half prefer one and half prefer the other site plan.

SONG residents also chose considerable customization of their homes, to allow for more individual creative expression and resident “sweat equity” opportunities. Thus, while SONG homes share a similar exterior look, the interiors vary a lot. While this has resulted in some wonderful designs, it also led to a more expensive and time-consuming building process. Because of the variations in design, and the two-phase building process, there were fewer economies of scale than in FROG.

Homes in SONG are primarily built out of Structurally Insulated Panels, or “SIPS,” which were quite a new building material in 2001. These 4x8’ panels look like giant sandwiches. The exterior is made from OSB (a recycled wood product), with an interior of foam insulation. They are very easy to handle, and fit together well. An entire wall can be built in a day. SIPS conserve wood, and create airtight building seals.

Two homes in SONG are timber-frame construction with straw-bales used as insulation. Straw is a natural material which allows more air-exchange than conventional building materials, while still providing excellent insulation. There is also one timber-frame house that uses traditional insulation.

Partly because of the complexity of the mini-district heating system in FROG (which meant that only a few specialists could fix problems), SONG residents chose to use a simpler heating system. Very small water heaters serve each duplex with both domestic hot water and back-up heating. Most SONG homes also have radiant floors, so the hot water flows through tubes set into the concrete.

TREE:

TREE has three inter-woven goals: accessibility, sustainability, and affordability.

Plans for the third cohousing neighborhood call for standardization of design and building, going back to the FROG model. TREE has chosen to create a denser site design, with 40 homes on 2.1 acres. This level of density is accomplished by including a four story building which houses the Common House facilities on the ground floor, as well as 15 flats, ranging from a small studio of 452 square feet to a three bedroom of 1150 square feet. They are all served by an elevator and are designed to be accessible to someone in a wheelchair. This is also an affordable way to build, since many units share a common building shell. And it is sustainable from the standpoint of conserving resources, because this compact design uses less land, fewer building materials, and has less need for heating and cooling since there are more common walls.

The remaining 25 homes in TREE range from a two bedroom of 1050 square feet to a 4 bedroom house at 1440 square feet. Many of the homes are designed to reach the very stringent Passiv Haus standard, a green building technique from Germany. Homes built to this standard utilize passive solar design, and are super-insulated (just as in both FROG and SONG.) What makes them different is that the level of insulation is much greater, with walls expected to be about 15” thick, and very tightly sealed against any drafts. An Energy Recovery Ventilator (ERV) will bring in continuous fresh air, while exhausting stale air from the house. These houses are expected to be so efficient that they could be heated with the equivalent of a hair-dryer! Typically Passiv Haus buildings use 90% less heating or cooling than standard homes. So far there are only 13 certified Passiv Haus buildings built in the U.S., and we are hoping to add 12 units - almost double

⁴ DOE report: http://www.energysavers.gov/pdfs/energy_savers.pdf

the existing number. It is not yet clear whether the flats in the Common House will also be able to be Passiv Haus certified.

Best Practices:

1. Green Building & Renewable Energy

Comparisons discussed above are reviewed in this chart:

	FROG (1996-1997)	SONG (2002-2004)	TREE (2012-2013)
Type of design	Standardized, 5 house types, 3 accessible units	4 house types with major customized elements, 1 unit retrofitted for accessibility.	Standardized, 3 apartment sizes, 4 home sizes. Accessibility emphasized.
Building materials	Double wall, stick-built	SIPS, straw-bale	Double wall, stick-built
Insulation	Blown in cellulose, R-30 walls	SIPS or straw-bale	Cellulose & closed cell foam, R-60 walls
Heating system	Passive solar, district heating, hydronic air handlers	Passive solar, Mini water-heater shared between duplexes, radiant floors	Passiv Haus with solar hot water, electric baseboard back-up
Renewable Energy	Neighborhood 50 KW PV ground-mounted system serves 30 homes	14 homes with PVs, 4 homes w. solar hot water	30-40 homes with PVs & solar hot water.

2. Densely clustered housing and Open Space:

Each of the three neighborhoods has 30-40 homes clustered on five acres of land which includes parking areas, yards, a Common House, some water features, community gardens, and substantial buffer zones. The actual footprint of each neighborhood (just the housing, yards, and internal neighborhood space) ranges from 2.1 to 2.9 acres. As discussed in the introduction, EVI is demonstrating a reversal of the typical suburban subdivision in which 90% of the land is developed with 10% as open space. In the EVI model, 10% is developed, with 90% open space.

Total acreage of land is 175 acres

	Prior Developer	EVI Total	FROG	SONG	TREE
Number of homes	150	100	30	30	40
Acreage for homes	150	15	5 acres	5	5 acres
Acreage/home	1 acre lot	.15/acre	.17 acre	.17 acre	.125 acre

EcoVillage created its own zoning, with the assistance of the Town planners. This Planned Development Zone includes designations of residential area, natural areas, and agricultural area. The residential area is discussed above. The natural areas include about 10 acres of woodland, and another 15 acres that are being allowed to become woodland. The remaining open meadows (about half of the entire land) are designated for agricultural use. Of this, 15 acres are currently being actively farmed, with plans to expand this in the near future by an additional 22 acres.

3. Modeling Low Energy and Water Use:

Over the past twenty years, some data has been collected about energy and water use at EVI. Studies have ranged from data collection by interested residents with a scientific background, to graduate student studies including students from Cornell University and MIT and undergraduates from Ithaca College Environmental Studies Program. Unfortunately, the data has not been gathered consistently, so there are many gaps.

Two recent resident-driven initiatives have been particularly helpful. Dr. Richard W. Franke, Professor Emeritus of Montclair State University in anthropology, put together a comparison between FROG Energy Use and U.S. single family homes, based on existing studies. And Dr. Francis Vanek, an adjunct professor in

engineering at Cornell University, and co-author of a textbook on energy conservation and renewable energy, studied gas and electricity usage in the entire village in spring, 2011, with the help of his electrical engineering graduate students.

In Franke's comparison, FROG home sizes (including use of the Common House) are only 60% the size of typical U.S. homes. FROG homes use only 29% of the water (compared to NY state), 59% of the electricity and 65% of the gas (both compared to Northeast U.S.). On a per square foot basis, FROG homes used 83% of the combined gas and electric, compared to households in the Northeast U.S. The ecological footprint of FROG members in 2002 was just 44% of U.S. average.

In Vanek's study, actual energy usage of both FROG and SONG was gathered for the entire year of 2010. Homes with photovoltaic panels, solar hot water, or woodstoves were taken out of the study, due to difficulty of assessing exact kilowatt hours or therms of energy provided by renewables. Although there is not comparable data for NYS available for 2010, a comparison of gas usage in 2000 indicates 60% of gas usage in FROG compared to NYS average in the same year. Electricity usage in both FROG and SONG in 2010 compared to 2005 NYS averages yields 47% of NYS average. Since electricity is only used for lighting in this case, it is less problematic to compare different years than gas, which is more seasonally variable depending on mild to severe winter weather.

Thus, while exact comparisons are hard to make, due to lack of comparable yearly data from NYS, it is clear that existing EVI neighborhoods are very energy efficient, and utilize water extremely well. Low water usage is aided by the use of low-flow fixtures (1.6 gallon toilets - uncommon in 1996 - were installed in FROG), as well as the use of rainwater catchment in some homes for irrigating gardens.

It is interesting to note that 25% of electricity used at EcoVillage is to power a pump that brings the required city water up the hill to the village. Thus lowering water use also means lowering electricity use. There is now a PV back-up system for water pumping when the electricity goes out.

Two new projects will substantially lower fossil fuel use for the village. FROG installed a 220 panel, 50 KW, grid-tied photovoltaic array in January, 2012. This ground-mounted array was developed to provide 60% of the electricity used by 30 households. It was paid for by a subset of neighborhood investors who will recoup their investment, plus a modest rate of return over 11- 15 years through rebates, tax incentives, and resident payments (similar to typical utility bills.) At the end of the payback period, the system will belong to the neighborhood.

TREE plans to install solar hot water and photovoltaics for all households that can afford renewables. This is a particularly good time to invest in these systems as the NYS and federal rebates and tax incentives are expected to offset 73% for PVs and 83% for solar hot water. With energy prices steadily increasing, and the outstanding financing currently available, TREE is on track to meet sustainability and affordability goals simultaneously.

4. Strong Social Ties:

At EVI, residents enjoy belonging to a community. Many people describe it as an extended family – everyone knows everyone else, and there are many important friendship ties between both children and adults. There is a wide range of ages – from toddlers to octogenarians – and some nice intergenerational bonds develop.

Cohousing is designed to promote community by making it easy to hold community meals, and by promoting shared interaction through the design of the homes and the pedestrian street. In our village setting, there are four evening meals a week in the Common Houses, one neighborhood-only meal for FROG and SONG, and two for village-wide participation. Adults and older teens are asked to contribute at least two hours a week on a community work team. These include cooking, dish-washing, Common House cleaning, maintenance, finance, and outdoor teams. Working together for the good of the whole promotes community spirit. It also keeps costs down, since neighbors can provide everything from simple bookkeeping to home-cooked meals to common maintenance tasks.



Dinner at the Common House provides delicious home-cooked food and a chance for residents to socialize.

Our community enjoys lots of seasonal celebrations such as “Guys Baking Pies” when the men and boys pick wild blackberries and make dozens of pies for a community party. We also have an annual Easter Egg hunt, celebrate Channukah with potato latkes, and have an annual Strawberry Solstice party. These are just a few of our many community parties.

Community involves more than celebration, however. When someone goes through a major life transition our village really shines. Dozens of people step forward to help someone who has just had a baby, is ill, has lost a loved one, or is going through a divorce.

People are also generous in sharing resources, such as cars, tools, outdoor equipment, or time, such as babysitting help, or helping to paint a room or move a household into a new home. Perhaps most important is that residents have generated a culture of sharing, which also dramatically lowers resource use (see chart on p. 13.) When residents have access to needed goods and services on site (including recreation) it cuts down on car travel as well.

5. On-Site Food Production:

Currently, EcoVillage at Ithaca has two on-site farms, West Haven Farm and Kestrel’s Perch Berries, both run by residents, and both set up as CSA’s (see discussion on p.3). Both of these farms contribute not only food, but as small businesses also provide some jobs. West Haven Farm has \$220,000 in gross revenues per year, and provides 7 full-time-equivalent (FTE) jobs during the growing season, and 2.5 FTE during the winter. Kestrel’s Perch Berries, a much newer farm with a very specific crop, grosses just \$11,500 per year, and provides several part-time, seasonal jobs.

In addition to these two farms, which both serve the greater public, many residents grow some of their own food in small garden plots. There are currently three community gardens, each with the requisite 8 foot fence to keep out deer, ranging from a quarter to half an acre. Other residents grow some vegetables or fruit trees in their yards.

An earth-bermed root cellar, designed as part of a student project, stores 2,000 pounds of root vegetables during the winter. These are purchased by the resident cook-team from several local farms, and are used for Common House meals.

6. On-Site Businesses:

In 2011, a membership survey showed a total of 109 adults and 58 children living in FROG and SONG. Of the adults, 14% were stay at home parents, 12% retired, and 74% had jobs. Of the wage-earning adults, 45% made most of their living on-site, and 55% off-site.

On-site jobs include a wide range of occupations such as: a child-care provider, two B&Bs, environmental educators, attorneys, musicians, farmers, graphic artists, green builders, software engineers, therapists,

writers, a sound engineer, gardeners, a housekeeper, and more. Many people work out of their homes, while others have offices in the Common Houses. Some serve other residents, some telecommute, and some have clients who come from around the Ithaca area. There are eight offices in the FROG Common House (including one for the use of the neighborhood), and three in the SONG Common House. Because TREE added additional flats in its Common House, it lost the space to include offices, except for a place for neighborhood records.

7, Waste Not, Want Not: Extensive Composting, Recycling, Reuse and a Culture of Sharing:

Each neighborhood has its own composting system. In FROG, there are four composting bins which are maintained by the outdoor team. FROG gets an annual delivery of leaves from the City of Ithaca to supplement other types of mulch that is layered with the compost. Each resident is responsible for dumping their own compost, and except for meat scraps, people are able to compost all kitchen scraps. The outdoor team also manages compost generated from the Common House meals.

In SONG, there is one community compost by the Common House kitchen, but most residents have backyard compost piles for their own use.

TREE, like FROG, plans a centralized compost system. All of the community compost generated is then available for people to use in their gardens.

There is also a good, county-wide system of recycling, which has recently changed to single-stream. Interestingly, EcoVillagers still maintain separate bins for cardboard and paper, as cardboard is frequently used in the permaculture gardening method called "sheet-mulching." By keeping a separate bin, residents can scavenge for cardboard more easily.

EVI has a phenomenal amount of re-use. For example, the community maintains a very popular ReUse room that provides a free place for clothing, shoes, and some household goods. Anything which is not taken is then donated to charity. There is also a free library for resident use, based on donations of fiction and non-fiction books. Likewise there is a free library of DVDs and CDs, including lots of classics and children's videos.

Besides these ongoing formal methods of re-use, there are many informal or spontaneous methods of exchange. There are a couple of Women's Clothing Exchange days a year (open to friends as well as residents). When a child outgrows clothes, toys, or outdoor equipment, they are usually handed down to younger kids for free. When someone decides to buy a new piece of furniture or appliance, they usually offer the old item for free or at a low-cost to community residents over email, and such items get snapped up within the hour. Leftovers from community meals are sold at just \$1.50/quart, so it is rare to have much left at the end of the meal.

Due to all the composting, recycling and reuse, trash is kept to a minimum. Currently our community of 60 households fills a 108 cubic foot dumpster every week, which is only about 25% of what typical US housing developments of this size generate. However, with more conscious effort we could reduce that, too.

Access to Shared On-Site Amenities:

Nature/Recreation:	Food Production:	Services:	Neighbors for Hire:	Goods & Clothing
One acre swimming pond Miles of mowed paths for recreation Playing fields Wild berries Shared outdoor equipment Sauna Ping-pong & pool	A 10 acre CSA organic vegetable farm A 5 acre CSA berry farm Three community gardens Chickens Trellises for grapes	Community Meals High-speed internet Meditation groups Support groups Free Libraries (Books & DVDs) Work-out room Woodshop & tools	Computer help House cleaning Gardening Childcare Graphic Design Yoga Classes Music Lessons Attorney Midwife Therapist Handyman	Used furniture Used computers & electronics Used appliances Used toys Re-Use Room Kid's pass alongs Women's Clothing Exchange

It is interesting to note that many of the shared amenities (such as FROG’s district heating or the new 50 KW solar system, or use of the woodshop or work-out rooms, or community meals) count on a well-organized system for accounting and billing residents.



The one acre swimming pond is just one of many shared amenities for residents and visitors.

8. Affordable, Accessible

While EcoVillage at Ithaca was planned primarily as middle-class housing, we’ve always strived for some economic diversity and reasonably priced homes. We’ve had mixed success. We’ve found that standardized design and construction (used in FROG, and planned for TREE) help to keep prices lower, and provide economies of scale than the more customized design and building approach taken in SONG . However, the addition of a Common House and other common amenities, including a pond, woodshop, and other community infrastructure easily add both value and cost to the project. One appraiser told me that she appraised EVI property at 20% higher than other typical townhouse developments, partly due to the sense of community which we have developed!

	FROG	SONG	TREE
House size	900-1,650 sq. feet (one BR – 4 BR plus study)	750- 2,500 sq. ft. (one BR – 5 BR)	425 - 1,440sq. ft. (Studio – 4 BR)
Approx. Cost in 2011	\$150,000-\$270,000	\$200,000-\$350,000	\$80,000-\$235,000

In TREE, we are exploring a partnership with a brand new, national non-profit organization, Partnership for Affordable Cohousing www.affordablecohousing.org , to see if they can purchase 5 units for rentals and rent-to-own. The partnership includes a local affordable housing agency and a local credit union, which would bring their expertise to the table. With the current severe economic downturn, there are many people who are interested in renting, rather than owning. However, to this date, it has been hard to find investors through PFAC for TREE, since there are relatively few units available.

TREE also chose to build 40 units, rather than 30 units, to spread out the common costs for land, infrastructure and the Common House. Building apartments in the Common House is also somewhat less expensive than building homes, and offers some very small units (two studios at 452 square feet, and six one-bedroom units at 736 square feet.)

Long-term affordability is another important consideration which factors heavily in TREE designs. By using extremely durable building materials (steel roofing, steel siding, and fiber-cement board), replacement and

maintenance costs are kept to a minimum. Likewise, use of Passiv Haus construction, means that at a time of increasing energy bills, TREE homes will use 90% less energy, with most of that supplied by solar energy, keeping long-term utility bills extremely low.

Interest in accessibility has grown as the population ages at EVI. In FROG, three homes were designed to be wheelchair accessible, with a bedroom and full bath, as well as kitchen and living room on the ground floor. One additional FROG home has been retrofitted to be wheelchair accessible, to accommodate a young teen with muscular dystrophy. In SONG, one home was retrofitted with an outdoor ramp, to accommodate a retired man in a wheelchair.

TREE, however, is being designed from the standpoint of aging in place. Thus all 15 apartments, and most (64%) of the homes are designed for wheelchair accessibility. There are eight homes that originally were designed to be accessible, but for cost considerations were turned into narrower duplexes. It costs about \$20,000 less to create the narrower duplex design, rather than the wider, stand-alone accessible house.

9. Open Space Preservation

As noted earlier, EVI preserves 90% of its 175 acre site for organic agriculture, natural meadows, forests and ponds. Before we purchased the land, Lakeside Development Corporation had planned to use the same acreage to build 150 units on one acre lots, leaving 10% as open space – areas that were either too steep or too wet to build on. EVI has been able to densely cluster 100 units of housing, plus a planned future education center, on just 10% of the land, leaving the remainder for farming, recreation and wildlife habitat.

In addition, we have a 50 acre permanent conservation easement with the Finger Lakes Land Trust, which protects land from development in perpetuity.

10. Hands-on Education

See Overview on first page, as well as Summary of Best Practices – Hands on Education, page 3.

There are currently two major programs of EVI-CSE, Groundswell Center for Local Food and Farming, and Climate Showcase Communities, both federally funded through three year grants. Both programs work with a number of other partner organizations.

In addition, there are a number of smaller programs, such as our collaboration with Ithaca College Environmental Studies Program, including teaching a sustainability-oriented course every semester, and teaching cultural competency to faculty and students. We also host about 1,000 visitors a year through free monthly tours, as well as popular group tours.

We offer occasional workshops, some of which have led to participants working to form ecovillages around the U.S. and internationally. My first book, *EcoVillage at Ithaca: Pioneering a Sustainable Future* (New Society, 2005) helped to popularize the concepts of cohousing and ecovillages. My second book, *Choosing a Sustainable Future: Ideas and Inspiration from Ithaca, NY* (New Society, 2010) won a 2011 Living Now Book award from Independent Publishers. This book helps to popularize the comprehensive approach to sustainability taken by residents of Tompkins County, and introduces dozens of organizations and activists.

At EVI we have found that the mere physical presence of a community that attempts to lead a life based on environmental and social values is inspiring to many people. There is a common “aha!” experience that one woman described well after taking a tour. She said, “You are showing us the future.”

Challenges, Difficulties and Lessons Learned:

Self-Development: EcoVillage at Ithaca is a grassroots organization, and each neighborhood was developed by the residents themselves. This was due in part to the “do it yourself” philosophy of the residents, partly due to the newness of cohousing and ecovillage concepts, and partly due to the small size and relative isolation of Ithaca. No local developer was willing to take the risk to create such a different model, and by the time SONG and TREE were ready to be built, the few cohousing developers who existed worked in other parts of the U.S. and did not want to work with a project on the East Coast that was not easily accessible.

Because there was no outside developer, each group had to raise all of the pre-development capital themselves. This was accomplished through requiring members in the forming neighborhoods to invest 20% of the estimated cost of their homes (similar to a down payment) before the homes were built. In each of the neighborhoods, this started out gradually, with an initial payment of \$2,000. As each of the hurdles of neighborhood development was reached (e.g. an architect was hired, house plans were developed, a site plan review was finalized with the Town, etc.) increasing amounts were invested, and with each new stage of development, the overall risk of the project was lowered. By the time the final amounts were invested, ground was broken and foundations were poured, all or almost all homes were pre-sold, and everything pointed to a successful completion of the homes.

Another aspect of self-development was each neighborhood’s responsibility for making all decisions regarding its design, financing, and construction. Because none of the neighborhoods had experienced developers in their midst, each neighborhood paid for a development manager and a neighborhood organizer (also called an organizational manager). These people served a crucial role in overseeing the myriad design and construction decisions to be made, helping to market the project, orienting new people, and organizing the group’s meetings. In FROG, a local design-build firm run by Jerold Weisburd served as the development manager as well as architect and construction manager. I was the neighborhood organizer for FROG, and worked closely with Weisburd. In SONG, Rod Lambert and I served jointly as co-development managers and I also served the function of organizing the group meetings. Mike Carpenter was the construction manager. In TREE, I currently serve as organizational manager, with Weisburd as architect and development manager, and Lecesse Construction as the pre-construction manager. These paid professionals brought a strong “let’s get it done” focus to each of the neighborhoods, and the expertise to help guide the way.

At the same time, each neighborhood group was composed of people who collectively had many different skill-sets, such as communication skills, legal background, building science, website development, gardening and/or graphic design. Part of the function of the group is to utilize these skills as well as possible, so that forming a neighborhood is truly a group creation.

Pros: The entrepreneurial model used by each of EVI’s three neighborhoods has been quite successful in many respects. It has allowed each neighborhood to develop, when no other developers were available to take on such an unusual project. In fact, without self-development, EcoVillage at Ithaca would not exist.

Because each group wanted to build a neighborhood that demonstrated its highest ideals, including many aspects of social, environmental and economic sustainability, each group attracted highly motivated, practical idealists who showed an extraordinary degree of commitment. Future residents came together from all over the country to form a vision, then took all of the necessary steps to actually bring that vision to reality – a huge task! Their commitment included attending meetings for several years or more, group problem-solving, an outlay of cash equivalent to the down payment on a house, and the patience and perseverance required to work with a large number of people from different backgrounds in a highly participatory manner. They also shared a huge risk that their time and money might have been invested in vain. Real estate development is a very risky business, and there are plenty of ups and downs along the way. Self-development was a little like taking a group roller coaster ride.

This heroic effort has paid off with immense satisfaction: residents enjoy a remarkably high quality of life, share a pride in their major accomplishment, and feel that their way of life can demonstrate aspects of a

more sustainable future. There are substantial cost savings as well. Their hard work has paid off in recognition as well. EcoVillage at Ithaca is often cited by the media as one of the best examples of a sustainable community in the world. As just one example, Canadian Broadcast Corporation held an hour long radio program on sustainable communities, as part of their popular "Quirks and Quarks" show. EVI was one of three existing sustainable communities around the world which was featured.

And Cons: Despite all the pros, it is clear that this model would not work for most Americans. The capital outlay required before construction is prohibitive for many people (although it could be argued that it is similar to the requirement for buying a house, just spread over several years, before one can move in.) The time commitment of actively participating in a group that is working on such a big project is also untenable for most people. Most people don't have either the time or the patience to participate in a group process that takes at least several years, and means hours of committee time and whole group meetings every month. There is also a steep learning curve required for ordinary people to learn how to handle the myriad layers of development. Self-developing a neighborhood means intensive problem-solving on everything from financing to marketing to house design to construction details. It also means having a "burning soul" or two who carries the project from start to completion. Since this requires even more commitment than an ordinary group member, and also requires excellent people skills as well as development skills it is a rare person who can fulfill this role.

Lessons Learned:

In her book, *Creating a Life Together* (New Society, 2003), Diana Leafe Christian states that 90% of aspiring ecovillage and intentional communities never get off the ground. The successful 10% are based on "movers and shakers" who take on the real-world tasks of establishing a core group with a strong vision, choosing a legal structure, finding and financing property, and developing the land. Christian says, "Forming a new community is like simultaneously trying to start a new business and begin a marriage – and it is every bit as serious as doing either." She goes on to say that founding a community requires "many of the same planning and financial skills as launching a successful business enterprise, and the same capacities for trust, good will, and honest, kind interpersonal communication as marrying your sweetheart." (p. 8). Both head and heart skills are involved.

At EcoVillage at Ithaca, we've been fortunate to have the idealism of the initial vision married with the practical skills of myself (as primary "burning soul" for each neighborhood) and others who bring an array of professional level skills, often on a volunteer basis, to the project.

However, for this type of development to be carried out in more mainstream settings, and to achieve a better than 10% success rate, it may be important to use a developer-driven model. At the same time, part of the strength of cohousing involves the participation of the group, so future residents should still be consulted on a regular basis. However, rather than spending time on the building process, the residents can work on building community and increasing membership. In fact, in Colorado and in California, as well as larger East Coast cities, this is how cohousing development is usually done. There is now a good track record for developer-driven cohousing. Of course, when developers get involved, the price tends to go up dramatically. In some cases, however, there are examples of developer-driven cohousing combined with affordable housing to create attractive alternatives, such as Takoma Village, in Washington, D.C. There are also some examples of cohousing developers who ask their clients to share both the financial risks and benefits of the project, which can help to lower costs.

Participatory Governance: At EVI, each resident group has chosen to use consensus decision-making, both during its formation, and for ongoing management of the completed neighborhoods. Consensus is very participatory, and requires finely honed communication skills by all group members. It is a method of decision-making used traditionally by Quakers and Native Americans, and more recently by many activist groups. The essential concept is to value everyone's contribution. Each person is perceived to have some part of the truth, and by careful listening the group's collective wisdom can emerge. Consensus is best used in relatively small groups who share similar values, have had training in using this method, and have excellent facilitation. It emphasizes making decisions which are best for the group, rather than for individual

