

Why our City and Region Needs a
Center for Excellence in the Built Environment
(CEBE)
and
How to Create it

Prepared

for

Shelley Midura, Chair
Utility Committee
New Orleans City Council

January 28, 2008

Preface

Most of the content of this report was obtained from the deliberative process, committee reports and final report of the New Orleans Energy Policy Task Force (EPTF), as well as from the following group efforts:

- The CEBE concept was formally introduced as a major component of *The Energy Hawk*, the report of the EPTF, Oct 10, 2007.
- The original notion of a *Center for Construction Excellence & Innovation* and substantial and continuing development of that project came from work provided by the New Orleans Regional Planning Commission (RPC) begun a year earlier.
- Volunteers and stakeholders were assembled subsequent to Oct 10th, 2007 to further develop and move the concept of the CEBE to reality.

That said, it should be noted, and apologetically so, that none of these three groups were formally invited to help write this report.

As Chair of the Utility Committee and understanding the great potential for this type of facility, Councilmember Midura stated that in order to help with the development of the CEBE, she needed the following information:

1. What are the potential sources of funding?
2. How did the Florida Solar Energy Center (FSEC) do it; (are there other models)?
3. Why do we need a building science research center?
4. What will the CEBE do?
5. Why is a building science research center good for our City/Region?

This document responds directly to these inquiries and expounds upon those answers; as such, the sections are numbered accordingly.

A proposal to create the CEBE is presented at the end of the second answer.

Acknowledgements

In response to a request from Councilmember Shelley Midura, I wrote and compiled this report. Significant assistance was provided by Norman Witriol, Dan Weiner, Harry Hoskins, Wade Byrd, Philip Fairey and Pres Kabacoff.

I want to enhance the standing and significance of the document by helping its readers to better understand the depth of knowledge of the contributors.

Norman M. Witriol, Ph.D. Physics, Brandeis University. Dr. Witriol has over forty years of experience as a research physicist, principal investigator, consultant, research manager, and company president on activities funded at the federal, state and university level. His expertise includes research and research management in building science ... Dr Witriol was an early member of the research faculty of the IfM at Louisiana Tech University in Ruston.

www.TheRegenGroup.com/bios.html

Daniel Weiner graduated from the Tulane School of Architecture in 1990 and is an architect with Wisznia Associates, AIA in New Orleans. Dan has a deep interest in environmentally-oriented design, recycling and renewable energy and is a long standing board member of the Green Project.

Harry Hoskins, attorney, BS in Engineering, West Point and a New Orleans native. Having lived through Betsy and Katrina and currently residing in a trailer, he has chosen to have a new home designed and constructed to the highest standards. Similarly, for his daughter, he is supervising the renovation of a historic home to standards considerably above code compliant. He was thus a natural best choice for the chair of the Outcome's Committee of the EPTF – the committee that endorsed the CEBE.

Wade Byrd should be very familiar to New Orleans government since for many years, he consulted for Legend Consulting while it helped the City Council regulate its energy utilities. Wade was a past vice-president of RESNET. He created Energy Rated Homes of Louisiana and trained almost all of the Home Energy Raters currently working in Louisiana.

<http://www.natresnet.org/conference/2001/bios.htm>

Philip Fairey, BA Architecture, Clemson University, M.S. City and Regional Planning, Deputy Director of the Florida Solar Energy Center (FSEC), a past president of RESNET and president of Building Consultants Group, Inc., a consulting firm specializing in building failures related to moisture control, pressure and air flow control, and building design and construction. In 1980, he initiated the building science research program at FSEC.

<http://www.natresnet.org/conference/2001/bios.htm>

Pres Kabacoff is a New Orleans native, as well as, chief executive officer and co-chairman of the board of HRI Properties, a full-service real estate company and national leader in the adaptive reuse of historic structures. Founded in 1982, the New Orleans-based company's mission is to revitalize cities by creating diverse, vibrant and sustainable communities. Pres serves as a co-chair of the EPTF. <http://www.revitalizationonline.com/article.asp?id=1161>

I want to thank all interested parties for taking the time to work on this exciting project.

Myron Katz, Ph.D. mathematics, U.C. Berkeley, New Orleans native, a founder of the Alliance for Affordable Energy, past president of the National Energy Raters Association, Certified Indoor Environmentalist and building scientist. He co-chaired the Conservation and Energy Efficiency Committee of the EPTF. www.EnergyRater.com/myronKatz/

Myron Katz, Ph.D.
January 28, 2008

Executive Summary

1. Identify the potential sources of funding.

With the support of Local, State and Federal agencies, it is expected that the combination of public and private funding sources will be adequate to originate this facility. Once established it will be able to better compete for government and foundation grants as well as industry contracts. Additionally, in the aftermath of Katrina, emergency rebuilding grants should also be considered a viable source.

2. How did the Florida Solar Energy Center do it (are there other models)?

a. FSEC came into existence via a 1974 act of Florida's State Legislature. Its employees were protected by academic freedom but not required to teach. Over the next 30+ years state funding increased from \$1 million in \$3.5 million. However, the center's growth exceeded this resource because of its ability to

- Compete successfully for government grants
- Continually expand the research directions and capacity
- Service manufacturers and research-oriented companies

b. The Institute for Micro-Manufacturing (IfM) garnered support from the State of Louisiana, followed shortly thereafter by the following Federal and State support:

1990: La Tech University obtained a \$750,000 planning grant from the Department of Energy (DOE)

1991/92: \$12 million infrastructure grants from DOE & the State of Louisiana

1996: Dedication of the IfM's 41,000 sq. ft. building

1999: Obtained \$12 million from a National Science Foundation (NSF) Epscor grant

2006: 200+ faculty, staff and associates, \$30 million in grants and contracts; five start-up companies, numerous patents, licenses, SBIR awards and industry partnerships.

c. The proposed method to create the CEBE describes a nurturing process where seed money funds a small group of scientists and staff (currently budgeted @ \$1.5 million) charged to simultaneously:

- 1) Plan and solicit the creation of a fully-fledged and endowed institution, and
- 2) Research, report on and develop modest but most pressing building science objectives.

By the beginning of the second year, a fully-fledged, endowed, chartered and organized, but small-scaled center will be up and fully functional.

3. Why is the CEBE Needed?

- Commonly held misconceptions about Energy Efficiency information are currently wasting millions of construction dollars.
- Current pursuit of Energy Efficiency, Code Compliance or Green Building often threatens comfort, health, safety and building durability.
- Energy Conservation is frequently overlooked in favor of less cost-effective, Energy Efficiency.
- The Marketplace is not encouraging Energy Conservation.
- Education, Research, and a source, when requested, of advice to the council on Public Policy initiatives provided and performed by CEBE's leading researchers will best serve our citizens.

4. What will the CEBE do?

The CEBE shall be a coordinated, public / private partnership, dedicated to research building science and establish best practices, train and certify builders and energy raters, certify above-code construction, provide quality control and quality assurance for the construction industry, initiate pilot programs, attract and incubate new energy-related businesses, improve the marketability of nascent energy conservation technologies, educate the public, and serve, when requested, as an advisor to the council on energy policy.

5. Why is the CEBE good?

The CEBE will stimulate the economy to produce more and higher paying jobs, help repair socio-economic inequities, protect our architectural heritage, redirect construction to protect lives, produce solutions that are best suited for local conditions, find the least-cost answers, successfully compete for federal funds and attract new industry to our city and region.

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1. Funding Opportunities

A. Start-up funding Opportunities

- Governor Elect's recent call for research funding opportunities
- Small contributor, private-source funding could use a vehicle similar to that employed by Brad Pitt's Pink City... By creating a site entitled: www.BuildItRight.org we can expect to garner \$ millions / year just as www.MakeltRight.org has done in the last few months.
- Large contributor, Private Foundation Funding: Appeal to foundations like the Rockefeller or the Pew foundation. This funding would probably be limited to "seed" money. This concept can be sold if the funding timeline is limited to only one to two years, namely just to begin the desired growth curve.
- An earmark in an Act of Congress, or funds from the National Agencies (similar to some initial funding for the Institute for Micro Manufacturing at La Tech Univ. in Ruston.)

B. Continuing MINIMUM FOUNDATION Funding Opportunities

- An Act of the State Legislature. (Duplicating or similar to the process used in Florida to create FSEC)
- Charter and allocation from the New Orleans City Government
- Charter and allocations from all governments in Greater New Orleans.
- Public-Benefit Fund assessment on the New Orleans utility bills.

C. Infrastructure grants/funding sources

- Act of the Louisiana State Legislature
- DOE, EPA, NSF, etc.
- Large contributor, Private Foundations

D. Continuing Competitive Marketplace Funding:

- DOE regularly advertises grant opportunities... FSEC successfully competes for several millions of dollars every year.
- Manufacturers of products sign contracts to get FSEC's "seal of approval" or to do perform further research projects... This technique, followed by most research centers, generates million of dollars each year for FSEC and other research, development and technology institutions.

E. Emergency Rebuilding Grants and Funding related to Katrina

- FEMA
- UNOP
- Bush-Clinton Katrina Fund
- Mayor's Office of Recovery & Management (ORM)

2a. How did FSEC do it?

A. Start-up and historical growth

1. 1973 Oil embargo led to a Governor's task force on energy. One recommendation was to create a center to promote solar energy use.

2. Act of Florida's State Legislature to form this center.

SEE: <http://www.flaseia.org/legislation/sec377.705.htm>

Note that the original goal was strictly SOLAR and largely focused upon the certification of solar energy systems that work in Florida.

3. Through legislative or administrative acts the employees and mission of FSEC were protected: they were tucked under the State's Board of Higher Education so that they would be governed by academic freedom and not be encumbered with a teaching load.

4. Here is a rough description of the history of FSEC's growth, provided by Philip Fairey, who directed FSEC for most of the years of its growth: "..., we were located at the south end of the Kennedy Space Center (on State University System property) from 1975 - 1995. We moved to our present location in September 1995.

1975: 3 professionals, 2 staff, 14,000 sq of space, housed in a state university system facility; \$1 million annual budget.

1976: 18 professionals, 22 staff, 14,000 sq ft of space.

1980: 30 professionals, 35 staff, \$3 million annual budget; expanded activities to include Building Science and PV research programs.

1983: 35 professionals, 40 staff, initiated Hydrogen Research program.

1995: 50 professionals, 65 staff and students, moved to new 72,000 sq ft facilities in Cocoa, FL; \$3.5 million annual state budget + \$8 million in contract funding"

B. Characterizing FSEC's growth in funding:

1. Deputy Director Fairey explained that over the years, annual state funding increased from \$1 million in 1975 to \$3.5 million today.

2. The FSEC's growth has exceeded this resource because of its ability to

a. Compete successfully for DOE and similar government grants

b. Expand the research activities to meet changing goals:

- Hydrogen powered research
- Energy Conservation.
- Building Science

c. Service Manufacturers or Research-Oriented Entrepreneurial Companies

- Contract to test already developed products, and
- Develop joint partnerships to create new intellectual property to the point of marketability.

2b. How did the Institute for Micro-Manufacturing (IfM) do it?

1990: Approximately three faculty members of the Department of Mechanical Engineering at Louisiana Tech University, in Ruston, La, with the support of the Dean of the College of Engineering and the President of the University obtained a \$750,000 planning grant from the Department of Energy.

1991/92: Launch of the IfM; with a \$10 million infrastructure grant from the US Department of Energy and \$2 million infrastructure funds from the State of Louisiana.

1994: Groundbreaking of the building

1996: Dedication of the IfM's building; 41,000 sq. ft. of laboratory and office space, (Laboratories occupy 20,000 sq. ft.) with about 20 faculty, faculty associates, and staff.

1999: Obtained a \$12 million NSF Epscor grant

2004: Attainment of the 200 mark for the number of faculty, staff and students

2006: Facilities valued at over \$50 million, with over 50 faculty, staff and associates, \$30 million in grants and contracts; five start-up companies, numerous patents, licenses, SBIR awards and industry partnerships.

2c. A Proposal for the Creation of the CEBE.

The proposed method to create the CEBE describes a nurturing process where seed money funds a small group of scientists and staff (currently budgeted @ \$1.5 million) charged to simultaneously:

- 1) Plan and solicit the creation of a fully-fledged and endowed institution, and*
- 2) Research, report on and develop modest but most pressing building science objectives.*

By the beginning of the second year, a fully-fledged, endowed, chartered and organized, but small-scaled center will be up and fully functional.

Start-up CEBE writing/planning project: (one month only)

- Allocate \$40,000 for salaries, travel and phone expenses for two scientists and one staff person, to be hired on a full-time basis to:
- Write a city ordinance and a state legislative act which endorse this plan and provide a substantial share of the seed money needed to fully fund the Proto-Building Science Center.
- Begin the process to solicit funds from State, Federal, and Private organizations including the Louisiana legislature, the Department of Energy, the Rockefeller and Pew Foundations and Google.
- Identify State and Federal leaders who will support and champion the CEBE.
- Continue the process already begun jointly with self-selected members of the EPTF and certain staff of the RPC of holding weekly meetings with self-selected stakeholders in government, non-profits, universities, corporations and trade groups.
- Clarify, revise and approve these proposals and the budget (Appendix A)
- Write job titles with their accompanying job qualifications for the following positions described, and arrange for their circulation to the general building science community.

Proto- Building Science Center (first year only)

Start up, Personnel, Budget, Facilities, Location and Timeline

- Clarify, revise and approve this proposal and budget (Appendix A)
- Write job titles with their accompanying job qualifications.
- Use \$1.5 million for the first year of operation.
- Hire 5 building scientists as well as 3 support staff and/or consultants on a full-time basis.
- Determine projects requiring consultants, write descriptions of deliverables and hire consultants for these needs.
- Rent commercial office space in New Orleans.
- This think-tank will have to do the next two projects ASAP, but definitely during the first year of its funding.

Modest Building Science Objectives of the Proto-Center

- Write "Best Building Practices for New Orleans" (BBPfNO)
- Initiate a publishing, educating and training program using BBPfNO
- Initiate a Pilot Mandatory Energy Rating in a Neighborhood of New Orleans.
- Perform, publish and apply research on vital building-science problems.
- Help develop nascent technologies to help to get them rapidly to the marketplace.

Proto-Center must plan the full-fledged center.

- Via continued weekly meetings with stakeholders in government, non-profits, universities, corporations, and trade groups locally, regionally, nationally and internationally, decide how to do or do most of the following:
 - Complete the charter of the CEBE.
 - Determine the location and building structure of the CEBE
 - Locate champions at the state and federal level who will actively support the CEBE.
 - Determine a timeframe to first publish "Best Practices"
 - Choose a timeframe to market "Best Practices" to the public.
 - Choose standards to certify above-code construction
 - Work with UL to provide quality control and quality assurance of the construction industry and so as to not duplicate efforts
 - Plan methods to educate the public.
 - Form liaisons and alliances with neighborhood associations.
 - Develop an energy-rater training program in New Orleans.
 - Plan an outreach program to builders to address their concern regarding incorporating new technologies.
 - Address the lack of availability of materials.
 - Form liaisons and alliances with builders.
 - Form cooperatives with universities and other institutes.
 - Collaborate with other building researchers specializing in "hot and humid climates", and sponsor conferences on this topic.
 - Assist colleges and universities in enhancing their building and energy science research and architecture curricula.
 - Incubate energy-related businesses.
 - Resolve the question regarding: who will/should charter and/or provide minimum foundation funding for the CEBE and how that might dictate CEBE's governance, goals and responsibilities?
 - Decide who will govern the CEBE?
 - Decide whether the CEBE will/should be co-located or administered within or next to an existing university?

- Write the equivalent of a "business plan" for this institution.
- Gather endorsements and advice from national organizations.
- Envision growth in stages – modeled on other, similar institutions.
- Develop a funding plan:
 - Solicit minimum foundation funding and/or charters from administrative and/or legislative branches of government.
 - Write bills or ordinances to submit to legislative bodies.
 - Consider Public-Benefit-Fund financing.
 - Write grant proposals.
 - Mine private, philanthropic sources: large foundations and individuals.
 - Investigate and promote contracting opportunities.
 - Create a fee-for-services schedule for Training, Certification of individuals and/or products.
- Solicit leading researchers to collaborate with the CEBE on joint research activities.

Onset of Realized Center (within one year after the creation of the Proto-Center)

- Established minimum foundation funding of at least \$1.5 million / year.
- Have in-place funding and growth plans.
- Designate and renovate or contract the construction of headquarters.
- Employ at least 9 full-time researchers and at least 1/2 that many more support staff.
- Grow by 100% every 10 years for the first few decades.
- Plan to have a physical plant able to accommodate growth for a minimum of 15 years.
- Expand the goals and functions of the institution in directions and at a speed similar to that experienced by FSEC.

A set of suggestions of how this might turn out can be found on the last page of this document. However, the author is not imposing these solutions onto the group of stakeholders. Such decisions are still open for discussion.

3. Why is the CEBE Needed?

A. Commonly held misconceptions about Energy Efficiency information are currently wasting millions of construction dollars. As examples:

- Paying extra for higher quality in New Windows in new construction is, almost always, cost-effective. But, replacing installed windows is seldom cost-effective. The worst choice of all is installing “Replacement Windows”.
- Installing wall insulation can be cost-effective while the walls are open, but is usually prohibitively expensive after the walls are closed. Moreover, more commonly than not, the wrong insulation material is frequently chosen, installed in the wrong places, and usually is installed improperly.
- On-demand water heaters cost more to install than standard water heaters with tanks, but in most cases, provide negligibly better energy conservation.

B. Contrary to what is widely believed, the current pursuit of Energy Efficiency, Code Compliance or Green Building often *threatens* comfort, health, safety or building durability. Examples are:

1. Adding features to homes to a) meet code, b) lower future energy costs, c) withstand hurricanes and floods and in rare cases to be GREEN or to claim to be "sustainable" (used without definition) make sense; but only when the primary focus stays on : a) comfort, b) health, c) safety of inhabitants and d) building durability. (DHSC)

Such short-sightedness is typically displayed with any of the following:

- Cooling inside to a temperature below the ambient dew point,
- Exterior walls are ill-equipped for rainforest precipitation,
- Foundations are not sufficiently designed to avoid subsidence,
- Installing water pipes in ambient conditions,
- Insulating historic walls without a rain plane,
- Installing a single speed AC without independent dehumidification,
- Allowing an AC unit to bring a home to a negative pressure,
- Placing foam insulation between rafters.

2. Being too focused upon building to flawed or inappropriate standards:

a) Accepting advice from out-of-state or even often out-of-region specialists often leads to poor consequences:

- Trying to dehumidify by increasing ventilation,
- Choosing a window for its barrier to conductive heat flow rather than to solar heat gain.

b) Aiming for Green building standards.

- The USGBC has no requirements that homes that meet their standards are any more durable than those that meet code.
 - Some homes awarded the Silver, Gold or Platinum USGBC standard have not been checked for meeting code, or even for meeting the energy standards with which they purport to be in compliance.
 - “Green Building” often promotes the use of building components that are not suitable to our climate.
- c) Errors in the building code that have not been remediated.
- Insulating the floor over an open crawl spaces
 - Re-roofing over existing roofs or over impermeable underlayments
 - Allowing AC over-sizing without independent dehumidification or dual-speed systems.

C. Energy Conservation is frequently overlooked in favor of less cost-effective Energy Efficiency.

1. Control can save more energy than energy efficiency
 - Multiple control points for lighting and HVAC, directly save more energy.
 - Ceiling fans, double-hung windows, solar screens as well as, operable windows save energy best when they are operated at the right time. But “Energy Efficiency” does not measure the major Energy Conservation effects of these actions.
2. Phantom loads can be over 20% of the problem.
 - Modern electronic equipment like Televisions and Cable Boxes are never completely off; some use tens to hundreds of watts in the “Off” position.
 - Each charging devices for flashlights, screw-drivers, cell phones continue to use a few watts of energy even when not connected.
 - As time goes on, homes tend to accumulate such “phantom” loads that can become a significant problem.
3. Indirect savings can be greater than direct savings:
 - Ceiling fans can save prodigious amounts of cooling energy indirectly, even though they actually heat a home.
 - CFL (compact fluorescent) lighting in a home can save more AC energy indirectly than that the amount used by the incandescent lamps they replace.
 - The use of a water pump to speed up delivery of hot water in a home, not only wastes hot water heat but also heats a home.
4. AC distribution efficiency is usually grossly ignored when referring to the efficiency of an HVAC system. In residences, research indicates:
 - 26% of energy is wasted because of duct leakage to outside.
 - 20% of energy is wasted because poorly insulated ducts are within very hot (summer) or cold (winter) attics.

- HVAC's induce infiltration by unbalancing internal airflows
- Lofts or open stairways grossly depreciates comfort and HVAC effectiveness and thereby greatly raises cooling and heating costs.
- Neither of the last two issues is incorporated into standard models of a home's energy efficiency calculation.
- In addition, RemRate, the most commonly used, US residential energy auditing software, grossly underestimates all of these losses for the climate zone containing New Orleans.

D. The Marketplace is not encouraging Energy Conservation.

1. The price of most energy is subsidized in a manner making it appear cheaper than its actual costs,
 - Energy from fossil and nuclear sources is grossly subsidized.
 - Energy from Solar is only now starting to be subsidized in parity.
 - But even more costs are externalized. Many believe that more than half of all costs are externalized.
 - When energy is wasted the environment unduly suffers, which, as we've seen in New Orleans, can lead to death and destruction.
2. Nega-Watts are cheaper and faster to "buy" than energy, no matter how it originates, but for most Energy Conservation options, the market is not providing the mechanisms for capitalists to maximize profits by investing in energy conservation.
 - Solving the Landlord-Tenant Problem: Since over 60% of pre-Katrina New Orleans residents were tenants and an even higher percentage of office space is rented, most buildings are not occupied by their owners. This situation creates a market disconnect since the owner buys the HVAC and the insulation, while the tenant pays the utility bill.
 - Retailers are dumping AC equipment in La that cannot be sold in other states.

E. Education, Research, and Public Policy initiatives provided and performed by CEBE's leading researchers will best serve our citizens.

4. What will the CEBE do?

The CEBE shall be a coordinated, public/private partnership, dedicated to research building science and establish best practices, train and certify builders and energy raters, certify above-code construction, provide quality control and quality assurance for the construction industry, initiate pilot programs, attract and incubate new energy-related businesses, improve the marketability of nascent energy conservation technologies, educate the public, and serve, when requested, as an advisor to the council on energy policy. (From The Energy Hawk, pp 12-13)

The CEBE is summarized above, described in four different ways within Appendices B – E and presented at www.EnergyRater.com/NOBSI/ .

Appendices B – E, present a:

- Full copy of EPTF's CEBE recommendation. (Appendix B)
- The recommendation of the Outcomes sub-Committee. (Appendix C)
- List of summaries of some the deliberative process of the EPTF that are relevant to the activities of the CEBE. (Appendix D)
- Structural description/outline of "What the CEBE Can Be and How It Can Be Organized?" (Appendix E)

www.EnergyRater.com/NOBSI/ NOBSI is the acronym for *New Orleans Building Science Institute*, a working name for the center. (GARIEI for *Gulf Area Regional Institute for Energy Independence* may be a better choice.) The NOBSI site was created for this report and this report only; there are no links to the site within the Internet. It was created to model, highlight and compare what FSEC is and what the CEBE could be. To that end, it is a very-edited, but highly-plagiarized version of the FSEC site. You should visit it because:

- Since it plagiarizes the FSEC site, the CEBE is compared to FSEC.
- To be as effective as the FSEC, it will require a web site as powerful.
- Although the website is obviously too ambitious for a fledgling entity,
- It presents a rich description of potential, long-term projects.
- Although, near-term cannot be distinguished from long-term projects,
- A future, potential, organizational structure is presented, as well as how that can ultimately benefit the public.
- The reader is strongly urged to study the ***OUTLINE OF SITE*** page (only accessible from the homepage) by spending at least 15 minutes there. Its **Dynamic Outline** format presents the content found in Appendix E in a more communicative fashion: ***both the overview and the detailed substructure can be seen without obscuring each other.***

However, when creating the NOBSI site, close attention to detail was purposely omitted in favor of the goal of providing an overview of what the CEBE could be. Vetted recommendations are not presented at the website. Many details at the FSEC site were not revised nor made to conform to the CEBE concept.

5. Why is the CEBE a Good Thing for Our City/Region?

The CEBE will stimulate the economy to produce more and higher paying jobs, help repair socio-economic inequities, protect our architectural heritage, redirect construction to protect lives, produce solutions that are best suited for our local conditions, find the least-cost answers, successfully compete for federal funds, and attract new higher paying industry.

Here are some details and additional benefits:

- The CEBE will directly and indirectly employ our people – those with the deepest understanding of our building infrastructure.
- Over 60% of the pre-Katrina population of New Orleans was tenants and an even higher percentage of offices and stores are rented. Thus to fix the problem of energy waste, we must address the more than 50% our building stock that has been excluded by market forces from major capital investment to lower energy use. (This is another shorthand description of the Landlord-Tenant Problem.)
- It will provide additional higher salary local employment.
- It will better preserve our architectural heritage.
- Many choices to save energy have NO COST; however, we cannot get there by focusing upon the wrong goals.
- We probably spend more money on advising the City's Utility Committee on Energy Supply Economics and their legal consequences than this center will spend annually. We can thus probably save more on energy bills for lower capital outlays – even if the City's Utility Committee's advising budget were the sole source of funding.
- We are poorly preparing for (but often too fixated upon) the next hurricane or flood. Long before that happens, our homes may either make us very sick or succumb to the chronic environmental stress-induced failure mechanisms from poor reconstruction choices made in the 3 to 4 years following Katrina. The CEBE is the best, cheapest and fastest way to correctly rebuild.
- This center is good politics – since it originates from a voluntary public effort in response to the disaster of Katrina, and its reconstruction aftermath.
- This is the least-cost method to save energy and protect our buildings

- The CEBE will be OUR CENTER – but it will be insulated from Politics – particularly if, it will be governed under the principles of *Academic Freedom* and meet the standards of the *Scientific Method*.
- This plan has the best chance to provide the flexibility to handle and prepare for the next set of problems – some of which are probably, currently unforeseeable.
- It is the best solution to respond to Global Warming in a comprehensive fashion.
- Allows us to eventually, successfully compete for DOE funding associated with Alternate Energy, Energy Conservation and Building Science. We can be confident that the research so generated will be very relevant to us because it will be tested and tailored to our unique climate and building stock.
- CEBE activities will promote Innovative Energy-Rated industry to locate in and near New Orleans.

APPENDICES

Appendix A. Tentative Budget for 1st Year: Proto- Building Science Center

Salaries:	5 staff members - salaries and overhead	\$750,000
	2 staff members	135,000
Consultants:		150,000
Rent, Utilities:		150,000
Equipment and Laboratory Supplies:		150,000
Office Supplies:		15,000
Travel:		<u>150,000</u>
Total		\$1,500,000

Justification

Salaries:

1. Five full time professionals with an average salary of \$100,000, plus overhead (covering a benefit package, including retirement, health benefits, etc.) of 50%.
2. Two supporting staff members with an average salary of \$45,000, plus overhead (covering a benefit package, including retirement, health benefits, etc.) of 50%.

Consultants:

Technical, Legal, Patent, Administrative: \$150,000.

Rent, Utilities:

Estimated at \$10,000/month plus overhead of 25%, \$150,000.

Equipment and Laboratory Supplies:

Testing Equipment for homes, plus laboratory equipment and supplies for research and testing of components, \$120,000, plus overhead of 25%, or \$150,000.

Office Supplies:

General office supplies, Xeroxing, fax, etc., \$12,000, plus overhead of 25%, or \$15,000.

Travel:

Travel inside New Orleans and vicinity (inspecting, testing buildings; administrative, technical meetings; etc.) trips to professional conferences for publicizing the CEBE, for recruitment, for giving lectures, and for professional development, etc., \$150,000.

Appendix B. “Center for Excellence in the Built Environment” from EPTF

*“ Center for Excellence in the Built Environment (CEBE)
With the expansion of conservation, energy efficiency, and renewable energy nationwide, regionally based building science centers have been established to define and promote best practices. New Orleans and its surrounding region are critically underserved in this area such that inappropriate building techniques are widespread with respect to fundamental climate factors and energy performance. The CEBE is currently being developed in coordination with the Regional Planning Commission, the Homebuilders Association, the Energy Efficiency Initiative, several nonprofits and universities. The CEBE will identify and publicize building science best practices for our region, southern Louisiana, and hot/humid climates; participate in the Energy Policy Commission; and create synergy among comparable city programs. The CEBE will serve as a local resource for local practitioners.*

*Create a Coordinated, Public / Private Partnership
Establish a charter for a CEBE as a public/private partnership modeled on the Florida Solar Energy Center.
Review and leverage similar initiatives and programs*

*Research Building Science and Establish Best Practices
Perform and document building science research that optimizes durability, health, safety, and comfort and incorporates conservation and energy efficiency methods
Assist colleges and universities in enhancing their building and energy science research and architecture curricula*

*Train and Certify Builders and Energy Raters
Train and certify the next generation of building-industry workers to best practices
Develop an energy rater training program in New Orleans*

*Certify Above-Code Construction
Create a mechanism for marketplace recognition of achieving the highest performance benchmarks and distinguishing quality in home construction*

*Quality Control and Quality Assurance
Provide research and training that supports quality control and quality assurance for conservation, energy efficiency, and renewable energy programs.*

Pilot Programs

Institute a pilot program that rates energy use on all buildings in a single neighborhood; analyze results, and recommend a city-wide program

Serve as a business incubator that supports nascent conservation technologies until they attain sufficient independence.

Educate the Public and Provide Policy Advice

Develop public education programs that promote best practices and cost-effective, conservation strategies compatible with the local climate

Weigh merits of alternative policy options and perform viability analyses

Benefits

- *Increase health, safety, comfort and durability of residential, institutional and commercial building stock.*
- *Build local capacity for developing building design technology.*
- *Lower utility bills by instituting conservation and energy efficiency.*
- *Lower health care costs by delivering better indoor air quality.*
- *Provide incentives for landlords to invest in energy efficiency upgrades in the apartments of their tenants.*
- *Establish New Orleans as the epicenter for advanced building design in the region.”*

(Quoted from the *Energy Hawk*, the Energy Policy Task Force Report to the City Council, October 10, 2007, pp 12-13.)

Appendix C. CEBE as recommended by the Outcomes Committee

“A Center for Excellence in the Build Environment (CEBE) should be established for research, education, training, certification, and writing policy, as well as charged with finding and promulgating the building science solutions that best fit New Orleans(diverse and exceptionally challenging building stock, geology, biosphere, hydrology and climate. The CEBE should be an institution not inferior to the Florida Solar Energy Center, while sharing a similar mission. New Orleans needs to know and regularly re-determine which set of building practices optimally ensure durability, health, safety and comfort (DHSC) and how to simultaneously pursue conservation and energy-efficiency (C/EE). Once the CEBE establishes its first description of (Best Building Practices for New Orleans, (the cadre of professions in the building industry needs to be retrained. These professionals include code-officials, energy raters, AC contractors, architects, home-builders, realtors and insurance agents, to name a few. The CEBE will develop the core educational materials for the general public, write policy statements, give seminars and workshops, and set up conferences, etc. to promote the best practices to the entire population and to all public and private corporations, institutions, governments and utilities.”

Appendix D. Summaries of Recommendations Relevant to the CEBE

At the onset of the work by the various committees of the New Orleans Energy Policy Task Force, a recommendation proposal process was somewhat formalized; it requested that a recommended goal be presented within a structured, 2-page, position paper. The following is a subset of summaries of those recommendations most associated to the goals, functions and proposed activities of the CEBE.

- All non-residential buildings larger than 5,000 sq. ft. owned or operated by the City of New Orleans and all such other government entities within the jurisdiction of the City Council shall be designed, constructed and certified at a minimum of the US Green Building Council's LEED New Construction Silver Level, or its equivalent at minimum 30% above Code.
- All new NORA residential construction and all NORA residential repairs for homes determined by the City to be more than 50% damaged shall be designed, constructed, repaired and certified at a minimum of Energy Star for Homes.
- NORA should adopt a point system for allocation of properties, applicants to receive one point for every 5% above Energy Star for Homes.
- Establish incentives for all commercial and residential construction that achieves at a minimum of the US Green Building Council's LEED New Construction Silver Level for commercial construction, or its equivalent at minimum 30% above Code for residential construction.
- Incentives could include waiving all building permits fees, relaxing certain building restrictions: such as parking requirements, height restrictions, set-back requirements, providing a 30-day guaranteed building permit-plan-check process, waiving the City's sales tax for green building products, any other tax relief the Council has jurisdiction over, which may include providing a 20% reduction in property taxes and density-bonusing zoning.
- Enhance incentives for all commercial and residential construction that achieve a Net-Zero energy use, (100% net reduction in consumption as compared to code-compliant energy-consumption).
- Graduate incentives – to be reduced linearly as the projected energy consumption savings decreases from 100% to 30%.
- Applicants for residential property from NORA incorporate Energy Star appliances, windows, air conditioners, furnaces, ceiling fans and appropriate insulation.

- Provide for utility rate rebates as an incentive for above-Code development.
- Promote Large-Tree Planting via zoned, square footage requirements for large scale trees in parking lots, incentives for large scale trees beneficially placed in mixed use and residential areas and incentives for use of landscaped trees and ponds to improve natural draining.
- Encourage replanting of local large-scale tree species which will flourish, such as live oak, bald cypress, red maple and black gum -- as recommended by the National Arbor Day Foundation for the New Orleans area.
- Encourage and promote voluntary planting of tree seedlings by property owners; seedlings to be provided free of charge by various non-City entities at centrally-located well-publicized distribution points throughout the City.
- Establish a pilot, energy-rating program for all homes and other buildings in one of the planning districts, perhaps to be funded by a foundation or other source of funding, the data to be compiled and a report rendered to the Council concerning the results. Pending these results of the report, the City Council will be asked to consider a City Wide energy rating program.
- Establish a relative performance rating system for each above-code construction standard, so that consumers can distinguish between each building standard.
- If a builder claims above-code compliance to any standard, then the builder must prove standard building code compliance as well as meeting the standards of the higher level of quality via 3rd-party commissioning.
- Create national partnerships with organizations, departments, and cities that would provide experts in policy development to help us to quickly assess what we have and what we need to develop the energy policy.
- Have several overarching strategies for meeting present & future energy needs would help guide this research and would facilitate the city to more quickly reach its goals for an energy policy that will place New Orleans at the forefront of national clean, green, safe & sustainable energy trends.
- The Integrated Resource Planning process would require ENO to undertake a resource planning process that is open to the public, regulators and stakeholders to plan what resources, including demand-side management (“DSM”) measures, will supply New Orleans’ electric energy needs now and into the future.

- Renewable Energy is energy derived from resources that are regenerative, rapidly replenished, or for all practical purposes cannot be depleted. Renewable sources of energy include biomass, geothermal, hydroelectric power, wind, photovoltaic, and solar thermal energy. Green energy is electricity derived from renewable energy.
- By a given date, a certain % of ENO's capacity or generation must come from green energy.
- Allow a net-metering customer to install, sell or rent PV equipment on real-estate discontinuous with the home or building "served" by that energy generator. The energy-generating equipment need not be installed on real-estate owned by the same owner as the building it "serves". Neither must the energy generation associated with an array of panels have independent inverters or meters to be deemed by the utility to be separate PV arrays for accounting purposes.
- Connection fees should be included in the base rate for energy.
- Rates should be inclining as in Austin Energy.
- Encourage the use of alternative less-polluting fuels and vehicles.
- Outlaw energy code compliance via prescriptive approach.
- Perform a baseline review of current energy use in the City of New Orleans.
- Use education to change energy consumption expectations and habits.
- Create a Technical Support Center for builders and residents.
- Be expected to testify at all relevant public hearings.
- Set mandatory targets for conservation with clear accountability and penalties.
- Amend the code to make it illegal to have any part of an HVAC system (except the condenser) outside of conditioned space.
- Capture natural and currently unfavorable energy flows on the surface of the structure, for reuse later in the day or year, when such temperatures are favorable.
- Encourage nascent renewable energy and energy efficiency companies to locate in New Orleans.

Appendix E: What the CEBE Can Be and How It Can Be Organized.

This content is most easily viewed at the *OUTLINE OF SITE* page, accessible from the home page of www.EnergyRater.com/NOBSI/ .

Mission & Goals

- Our mission is to research, develop and promulgate region-specific building & energy-conserving technologies and market-based policies and incentives that enhance and protect the people, architecture, environment and the economy in order to allow New Orleans and its neighbors to rebuild in a manner to best allow the region to prosper for another 300 years.
- Change the market so that it is easiest for people to reside in homes that
 - Waste much less energy, and
 - Are durable, safe, healthy, and comfortable (DHSC) despite the catastrophic and chronic challenges common to New Orleans.
- A Center for Excellence in the Built Environment (CEBE) should be established for research, education, training, certification, and writing policy, as well as charged with finding and promulgating the building science solutions that best fit New Orleans' diverse and exceptionally challenging building stock, geology, biosphere, hydrology and climate. The CEBE should be an institution not inferior to the Florida Solar Energy Center, while sharing a similar mission. New Orleans needs to know and regularly re-determine which set of building practices optimally ensure durability, health, safety and comfort (DHSC) and how to simultaneously pursue conservation and energy-efficiency (C/EE). Once the CEBE establishes its first description of "Best Building Practices for New Orleans," the cadre of professions in the building industry needs to be retrained. These professionals include code-officials, energy raters, AC contractors, architects, home-builders, realtors and insurance agents — to name a few. The CEBE will develop the core educational materials for the general public; write policy statements, give seminars and workshops, setup conferences, etc. to promote the best practices to the entire population and to all public and private corporations, institutions, governments and utilities. {Quoted from the Outcomes Committee Final Report, August 2007}

Activities

Research

Energy Conservation

Energy Efficiency

Controls save more than Energy Efficiency

- Multiple control points for lighting and HVAC, directly save more energy.

- Ceiling fans, double-hung windows, solar screens as well as, operable windows save energy best when they are operated at the right time.
- But “Energy Efficiency” does not measure the major Energy Conservation effects of these actions.

Phantom Loads

- Can be over 20% of the problem.
- Modern electronic equipment like Televisions and Cable Boxes are never completely off; some use tens to hundreds of watts in the “Off” position.
- Charging devices for flashlights, screw-drivers, cell phones continue to use energy even when not connected; these eat up a few watts each.
- As time goes on, homes tend to accumulate such “phantom” loads that can mount up to be a significant problem.

Nascent Technologies

are under-used technologies that can save tremendous amounts of energy

- Ground Source Heat Pumps
- Hydronic HVAC Distribution Systems
- Solar Powered, Passive Dehumidification
- Desuperheaters

Overcoming Barriers to Energy Conservation

- Building Code
- Historic Preservation

Devices with uncommon Energy Conservation potential

- Ceiling Fans
- Double-hung windows
- Window Bug Screens
- One light switch per light bulb.
- Fluorescent and LED Lighting
- Occupancy-monitoring switches
- Magnetic-Induction Cooktops
- Front-loading washing machines

Trees

- encourage and promote voluntary planting of tree seedlings by property owners

The Most Common Problems or Errors

- Ceiling Lighting Cans
- Fireplaces
- Open Stairways or Loft style architecture
- Replacing windows during a retrofit
- Placing insulation between floor joists

- Installing one-speed HVAC systems
- Intentional and/or Unintentional Vapor Barriers
- HVAC-induced infiltration
- HVAC in vented attics
- On-Demand Water heaters
- Using energy design advice provided by non-local experts, vendors, or local practitioners who are vested in the sale

Building Science

- Laboratory Research
- Computer Simulation Research
- Field Research
- Survey Research
- Buildings Diagnostic Methods
- Design Assistance
 - Certify the Effectiveness of Projects and Competitors of the Energy Efficiency Initiative
- Training
- Indoor Air Quality
- Energy Ratings
- Green Building
 - (with the goal to minimize the footprint on the earth)
- Durability
 - Disasters
 - Global Warming Effects
 - Chronic Environmental Stress-induced Failure Mechanisms
- Energy / Building-Science Audits
 - Train Auditors to promote Energy Conservation while protecting the home's durability, and the health, safety and comfort of its occupants (DHSC).
- Commonplace details that often cause major problems
 - Placing insulation between rafters below a roof with an impermeable underlayment.
 - Incomplete flashing around windows
 - Short roof overhangs
 - Sizing AC units at 500 sq ft per ton
 - Insulation between joists

Renewable Energy

- Photovoltaics
- Solar Thermal
- Waste to Energy

Transportation

- Sequencing Traffic Lights to reduce stop-and-go idling

- Traffic lights on entrance ramps to facilitate fast traffic speeds and high throughput during rush hours
- Switch the taxi fleet to hybrid taxis
- Prioritize mass transit, and the use of alternate
- Build the city in a concentrated and compact manner, which favors public transit and shorter commutes

Public Policy (See full list in its own section.)

Consumer

- Disaster Preparedness
 - Passive Survivability
 - Safe rooms
- Energy Conservation & DHSC Education
 - Technical Support Centers
 - Web Site
 - Physical Place to talk to People and provide trainings
 - Inserts for distribution in Energy Mailings
 - Speakers to Community Groups
- Solving the Landlord-Tenant Problem
 - Mandatory Energy Ratings
 - Pilot Program
- Demystifying Federal and State Tax Credits, Rebate programs and similar incentives
 - How and when to apply for them
 - Costs vs. Benefits
 - All needed documents and assistance provided
- Working with retail merchants
 - Identify and encourage the good vs. poor products
 - Training & certifying sales staff
- Workshops and Conventions
- Performance Contracting

Education

- K - 12
- University
- Continuing Educating
- Community Partnerships

Industry

- Testing & Certification
- Software
- Data Monitoring
- Training and Certification of Contractors and the rest of the Building Community

Public Policy

- Advise Government
 - City Council, Legislature and Congress

- and as invited: Major, Governor, etc.
 - Serve on the New Orleans Energy Policy Commission
- Advise on Utility Regulation
 - Integrated Resource Planning
 - Set Energy Efficiency Targets for the City
 - Net Metering
 - Develop Incentives for the Utility to profit from Energy Conservation
 - Decouple Utility Profits from Consumption
- Transform the marketplace to make it most profitable to “buy” energy conservation and more durable home construction.
 - Run and research effectiveness of Pilot Programs: e.g., Mandatory Energy Ratings in a Neighborhood
 - Identify defects in the Marketplace
 - Dumping of inefficient Appliances
 - Difficulty to find optimal equipment
- Encourage the planting of large scale trees
 - Provide for zoned, square footage requirements for large scale trees in parking lots, incentives for large scale trees beneficially placed in mixed use and residential areas and incentives for use of landscaped trees and ponds to improve natural draining.
- Promote Above Building Code Construction
 - Write the first version and regularly revise “Best Building Practices for New Orleans”
 - Advise on Revisions to the Building Code
 - Define New and Above Code Standards of Construction and lobby for their enactment and enforcement
 - Establish a relative performance rating system for each above-code construction standard, so that consumers can distinguish between each building standard.
 - Help the City establish enhanced incentives for all commercial and residential construction that achieve Net-Zero energy use, (100% net reduction in consumption). The City should establish graduated incentives which reduce linearly as the projected energy consumption savings decreases from 100% to 30% (as compared to code-compliant energy-consumption).
 - These incentives could include waiving all building permits fees, relaxing certain building restrictions: such as parking requirements, height restrictions, set-back requirements, providing a 30-day guaranteed building permit-plan-check process, waiving the City(s) sales tax for green building products, any other tax relief the Council has jurisdiction over, which may include providing a 20% reduction in property taxes and density-zoning bonusing.

Organization (suggestions to be considered)

Chartered and funded by the City of New Orleans:
\$1 to \$3 million a year.

Governing Board:

Made up of a representative from each accredited university or college within 150 miles of New Orleans that has a department primarily devoted to any of: Engineering, Architecture, Building Science, Energy or Utility Economics, Public Advocacy or Law.

Size

It is projected that the center will grow from around ten researchers in the first year to over 50 within a decade. Throughout that time, twice that many support, graduate students and training personnel will complete the roster of employees.

Active Liaisons with Colleges & Universities

It is projected that at least 1/3 of the man-hours provided at the center will be provided by university faculty or graduate students.

Public / Private Partnerships

The center will encourage private business to make relationships that will be mutually profitable. When products or inventions go to market, the center may share in the profits or output the surplus royalties beyond the Center's needed operating expenses to the City of New Orleans.

Independent Research Environment

Leading researchers, whether from industry or other educational research institutions will be especially attracted to work at the CEBE because they will be rewarded with the opportunity to keep a greater share of the research grant moneys they attract and/or a greater share of the intellectual property they develop.

Can enter into any kind of shared Intellectual-Property Agreement

Located in a renovated commercial or industrial building in New Orleans

It is envisioned that the temporary or permanent home of the CEBE could be inexpensively reconstructed from a company abandoning a location, much like the renovation of the *Universal Furniture* Building on St Claude at St. Roch Street.