





Proactive By Design.
Our Company Commitment

Wayne Cobleigh, CPSM, GZA GeoEnvironmental, Inc.

Rebecca French, Ph.D., Connecticut Institute for Climate Resilience and Adaptation (CIRCA), University of Connecticut



Questions and Solutions



3 QUESTIONS THAT CAN CHANGE YOUR LIFE



Innovators often go through these three questions, repeating the cycle many times before getting a brilliant answer.
- amorebeautifulquestion.com - rightquestion.org



Why? Let's confront a problem and a present reality.

What if? Envision what might be. What if we borrow an idea or try some combination of X and Y?

How? Turn speculation into reality. How can we get this done? What are the first steps?

If my idea isn't working, how can I figure out what's wrong and fix it?








Elevate Housing: Shore Up CT

Situation in Connecticut in 2015


- \$85-90-150K to elevate house (\$35-40K in PA)
- Require elevation to .02% per year probability storm event design flood elevation + 1 foot
- NFIP insurance premium reduction \$2600/yr to \$400/yr
 - Sometimes you can do better: recent \$300K loan with NFIP reduction of \$4,482/yr to \$487/yr
- Challenges
 - Low and moderate income
 - Home by home approach
 - Roads are not elevated

Elevate Housing: Shore Up CT




Loan Program Overview


- 15 Year Term
- 2.75% interest rate (2.895% APR*)
- 1% origination fee
- Minimum \$10,000 to maximum \$300,000
- No monthly principal or interest payments for the first 12 months








**APR is based on Loan Amount of \$125,000 - 168 payments of \$897.29*

** on Loan Amount of \$90,000 - 168 payments of \$646.05.*












HOME ELEVATION BENEFIT COST ANALYSIS


No elevation scenario
Annual NFIP Insurance premium-- \$2600

Elevating house (\$90K)
Annual Insurance premium-- \$400
Monthly Loan cost-\$646.05 over 14 years beginning in year 2
Property tax and market value increase – an incentive to be proactive or not?








Infrastructure Resiliency Innovation: Microgrids Grants and Loan Program


- \$23 million in grants for microgrids
- Partner with Green Bank to provide additional financing for support and implementation
 - Generators, fuel cells, or any other type of electrical energy production source
 - Fuel tanks, piping, or fuel regulation equipment
 - Foundations, except for electrical interconnection equipment as defined above
 - Excavation, trenching, paving, etc. – except for underground electrical interconnection of the microgrid
 - Mechanical equipment or piping
 - Thermal insulation

















GEOTECHNICAL


ENVIRONMENTAL



ECOLOGICAL




WATER



CONSTRUCTION MANAGEMENT



Critical Infrastructure: Clean Water Act State Revolving Fund


- Grants range from 20% to 50% of costs
- Loans are repaid 2% over 20 years
- Reserve for construction of resiliency projects for **sea level rise** FY15 \$4M (20% grant/80% loan)
- Reserve for **green infrastructure** (20% grant/80% loan or 50% grant/50% loan)











GEOTECHNICAL


ENVIRONMENTAL



ECOLOGICAL


WATER




CONSTRUCTION MANAGEMENT


HUD National Disaster Resilience Competition: SAFR* Connecticut Connections

- Financing leveraged in Phase 2 application
 - Leveraging public-private partnerships
 - Building on existing programs (Shore Up CT, Green Bank, Microgrids and CWF)
 - Targeting Low and Moderate Income households
 - Mix of grants, low interest loans, vouchers
 - Retrofitting structures: **housing and critical infrastructure**



* State Agencies Fostering Resilience

GZA

GEOTECHNICAL ENVIRONMENTAL ECOLOGICAL WATER CONSTRUCTION MANAGEMENT

WHY PROPERTY ASSESSED RESILIENCY FINANCING?



CIRCA
Connecticut Institute for Resilience and Climate Adaptation

UCONN
UNIVERSITY OF CONNECTICUT

GZA

CONNECTICUT GREEN BANK

GEOTECHNICAL ENVIRONMENTAL ECOLOGICAL WATER CONSTRUCTION MANAGEMENT

Green Bank Attributes of C-PACE* for PAR

- Access to PRIVATE financing of mitigation measures with senior lien for qualified upgrades and repaid via a benefit assessment on the owner's property tax
- Requires legislative consent of municipality and existing mortgage lender
- Savings from upgrades payback over loan period enforced by legal, financial and technical underwriting

* Commercial - Property Assessed Clean Energy

CIRCA
Connecticut Institute for Resilience and Climate Adaptation

UCONN
UNIVERSITY OF CONNECTICUT

Resilience Outcomes

- Elevation
- Mitigation
- Retreat
- Job creation

Return on Investment

- Increased property value
- Insurance savings
- Reduced losses
- Reduced risk
- Property tax stability

Benefit Cost Analysis
Return on Resiliency
Lower Risk and Insurance Costs

Standards to mitigate flood and wind risk and reduce disaster recovery costs

Increase property value
business continuity & community economic stability

Increase elevation and resiliency

CIRCA
Connecticut Institute for Resilience and Climate Adaptation



UCONN
UNIVERSITY OF CONNECTICUT

References

1. Berger, Warren, *A More Beautiful Question: The Power of Inquiry to Spark Breakthrough Ideas* (Bloomsbury, March, 2014).
2. Berger, Warren, *Chasing Beautiful Questions*, Spirit Magazine, p. 9-14, April, 2014.
3. Kunreuther, Howard; Kousky, Carolyn; *Addressing Affordability in the National Flood Insurance Program*, Journal of Extreme Events, Vol. 1, no. April, 2014.
4. Bailey, Jessica, C-PACE: Commercial & Industrial Property Assessed Clean Energy Presentation to ICSC May 2013 and www.c-pace.com
5. American Society of Civil Engineers, Flood Resistant Design and Construction Guidance Standard, ASCE 24-14.
6. Insurance Institute for Business and Home Safety, Fortified Overview at www.disastersafety.org/fortified-main/
7. Petrenko, Fedor, *Finance for Resilience Chooses Winning Innovations*. Yale Center for Business and the Environment. <http://cleanenergyfinanceforum.com/2015/04/24/finance-for-resilience-chooses-winning-innovations/>

CIRCA
Connecticut Institute for Resilience and Climate Adaptation

UCONN
UNIVERSITY OF CONNECTICUT



References (continued)

8. Bailey, Jessica, PACENow, March 16, 2015, Public Comments to Members of the Energy and Technology Committee of the Connecticut Legislature on *H.B. No. 6995 (Raised) An Act Concerning a Residential Property Assessed Clean Energy Program*.
http://www.cga.ct.gov/asp/menu/CommDocTmyBillAllComm.asp?bill=HB-06995&doc_year=2015

