

**Out Think The Box**

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**Principal Innovator**  
Kimberly (Kim) King



# Request For Qualification

## RFQ

Single Occupancy Tiny Dwelling Equipped with Renewable Energy Systems Technologies and Eco-Sanitary Dry Compost Toilet System

### Prepared for:

Nancy Skinner

#### CA State Senate

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Proposal Issued:

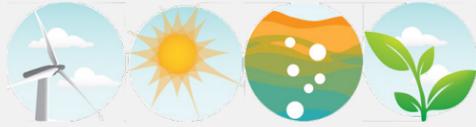
**12.27.2019**

Proposal Valid to:

**01.12.2012**

### Statement of Confidentiality

- This proposal and supporting materials contain confidential and proprietary business information of Kimberly King and Out Think The Box. These materials may be printed or photocopied for use in evaluating the proposed project, but are not to be shared with other parties.



# Purpose of the RFQ

## REST (Renewable Energy Systems Technologies) in Urban Agriculture + S.E.E.C. (Sustainable Energy Efficient Comfortable) Home

The REST in Urban Agriculture + S.E.E.C. Home opportunity can support citizenry that would like to become tiny dwelling inhabitants, where the tiny dwellings/homes are located on vacant lots.

This offering can provide these stakeholders with resilient, reliable and innovative, sustainably developed urban adaptation planning and implementation services including renewable energy systems technologies (REST), ecological sanitation (eco-san) dry compost toilet systems, water-resource management, and hyper-intense/bio-intense urban farming opportunities.

### Business Case

- Renewable energy systems technologies (REST)
  - Off-grid photovoltaic (PV) array for normal day-to-day electricity needs, and for support of vital services during disaster-relief events, such as:

- Communications – telecommunications, internet
- Building security
- Lighting, Refrigeration, Heating/Cooking (Propane is optional.)
- Eco-sanitation (Eco-san) where human excreta (toilet waste) and other compostables i.e. kitchen refuse, are fully recycled in a process that ideally produces food, and enhances the health of the entire ecosystem.
- Water resource management for bathing and hygiene, potable, and purification for drinking water offsets:
  - Passive solar hot water
  - Water reclamation of rainwater
  - Extraction of atmospheric water
- Urban agriculture using hyper-intense/bio-intense methods for fortifying food security.

“ This offering provides energy, ecological sanitation, water management, and food security opportunities—*Everyday brilliance for disaster resilience* ”

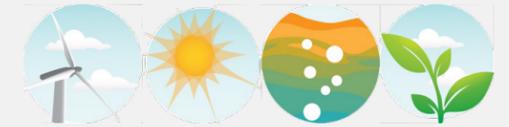
### About Out Think The Box

- Out Think The Box designs and fosters the development of day-to-day, unconventional, place-based, pragmatic, mindful, agile urban adaptation strategies that adhere to the mantra *PREPARE. RESPOND. ADAPT.*, because the ‘indifference’ and ‘undesirables of Mother Nature are only going to continue to escalate...

### What Out Think The Box does

The offerings:

- ▶ Sustainable, Energy Efficient Comfortable (S.E.E.C.) Homes
- ▶ Renewable Energy, Ecological Sanitation, Water Management
- ▶ Urban Agriculture Best Practices



# Purpose of the RFQ (Cont'd)

## The problem, challenges and needs addressed by this proposed activity

Prior to the occurrence of a natural disaster, it has been demonstrated time and time again the citizens of the USA think little about the reliability and importance of un-interruptible power, sanitation, clean water or food access, until it's not there. Society is dependent on commodities over which individuals ultimately have minimal control. Whether it's electricity, gasoline, diesel, natural gas, buildings and communications devices that require constant access to energy. Without energy, or access to potable water, the citizenry of the 21st century can barely survive.

The short-term consequences of disaster-related events come with damaging economic effects that can linger for a very long time. Livelihoods have been hampered by major events that have destroyed or compromised their electricity generation, sanitation service, potable water options and food access.

“ This offering provides energy, ecological sanitation, water management, and food security opportunities—*Everyday brilliance for disaster resilience* ”

### The Problem

- As the frequency and magnitude of climate instability, and natural disasters increases, financial establishments or other unexpected/unanticipated events become increasingly more tenuous, where livelihoods currently powered by sub-par ‘conventional’ energy, sanitation and water services are likely to experience interruption.

Energy, sanitation, water and food systems need to be agile, adaptable, resilient, and as robustly designed as possible. These systems need to stand the test of time post-disaster, requiring adaptation employing *everyday brilliance for disaster resilience*.

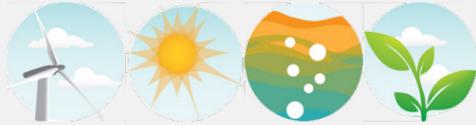
This proposal offers a way to provide short-term contingencies that can also have long-term beneficial effects. Providing contingency plans that prepare the local citizenry to address the short-term, immediate energy, sanitation, water needs, and locally grown food, but also provide a long-term means to adapt.

Adaptation includes fortifying the energy system by designing and building with greater redundancy by incorporating, where appropriate, resources based on geographic predisposition. This includes configuring the renewable energy device(s) to be autonomous when the grid goes down—hence usable when they are needed most. Implementing self-sufficient sanitation, water management and locally grown food are also part of this offering.

### Strategies

Strategies offered:

- ▶ Short-term contingencies with long-term benefits
- ▶ Adaptation and agility
- ▶ Autonomy and self-sufficiency



# Principal Innovator

**Kimberly King**



**Position:** Director of Engineering

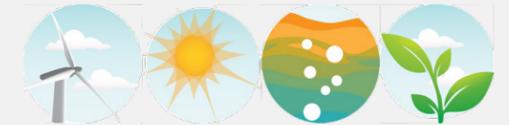
**Experience:** 10 years

Kimberly (Kim) obtained her BSc in mathematics, engineering mathematics, minoring in biology. Equipped with an engineering post-graduate degree in renewable energy systems technology from the Centre for Renewable Energy Systems Technology (CREST) at Loughborough University in the Midlands of the UK. She possesses comprehensive knowledge of current research and trends being conducted in the field of renewable energy, sustainability development and ecological sanitation (eco-san); nationally and internationally.

Kimberly is able to design and assemble renewable energy (RE) systems and components i.e. solar, small wind systems, micro-hydro, and storage (battery). The RE technologies recommended and/or selected depend on one's geographical predisposition, resource availability, and the end-use need.

Kim's comfort zone is taking bold, decisive and definitive action to out think the box and identify opportunities for developing and implementing *everyday brilliance for disaster resilience*. This includes offering unconventional, day-to-day place-based, pragmatic, agile urban adaptation strategies. *PREPARE. RESPOND. ADAPT*

“Specialties: systems engineering, user innovation, renewable energy systems technologies in urban applications, technical writing”



# Goals and Activities

*So you to feel informed and empowered during the project progression, milestones and steps involved follow...*

## Project Milestones

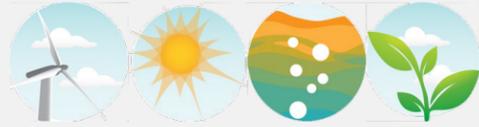
▶ Research: Preliminary Site Analysis Review Criteria	<b>Step 1</b>
▶ Research: Rate and Select Tiny Dwelling Site Location(s)	<b>Step 2</b>
▶ Technical Design: Tiny Dwelling and Sustainable Development Support Systems Installation	<b>Step 3</b>
▶ Development: Detailed Analysis for Short-term Emergency Preparedness and Long-term Benefits	<b>Step 4</b>

### 1 Preliminary Site Analysis Review Criteria.



The purpose of Step 1 is to screen for potential locations and identify appropriate sites for the installation of an autonomous mobile tiny dwelling. Filters are applied to evaluate potential sites that would preclude an installation for a tiny dwelling using a solar photovoltaic (PV) system and eco-san, dry toilet system; screening criteria filters include:

- **Insufficient cover material resources and insolation** | Economically viable compost projects and solar electric systems can be developed using 'marginal' cover material and solar resources as a preliminary filter for identifying sites.
- **Setbacks** | Insufficient set backs from property lines, residences, buildings or other sensitive receptors. In Step 1, a conservative 'rule of thumb' and safety setbacks will be used.
- **Access** | Available access pathways for siting of the tiny dwelling.
- **Stakeholder engagement** | Successful projects are embraced by the community, if the community is included in the design process. Potential interference with scenic view sheds must be considered. Conducting a meeting for community comment would be prudent.
- **Permitting** | Successful permitting of a sanitary compost system is dependent on a number of factors, so enumerating definitive filters in advance of determining potential sites and locations is difficult. An Authority Having Jurisdiction (AHJ) to sign-off on milestones is recommended. As a part of Step 1, identified sites will be scored for presumed complexity in permitting.



## Goals and Activities (Continued)

“ **Step 1 Deliverable:** A summary describing the sites reviewed, the findings, and site recommendations for a mobile tiny dwelling utilizing an eco-sanitary (eco-san) dry toilet compost system installation.

### 2 Rate and Select Tiny Dwelling Site Location(s)

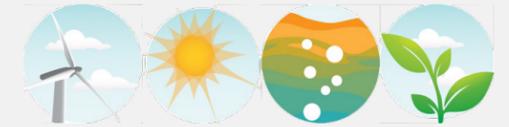
- ■ ■ ■ The second step toward implementing this offering requires obtaining a vacant (or tax-defaulted) lot for the tiny dwelling(s) and prospective, urban farm. In Step 2, a work session will commence to review the findings of Step 1, so the sites under consideration for a final installation can be identified. During this step, a review estimate of the requirements and cost will be conducted at the proposed site, and a public information plan and schedule will be adopted. The aim is to create an effective communication tool to conduct at public stakeholder meetings.

A couple of prospective locations follow:

Prospective Location 1 Details	
▶ APN 5-387-15   1608 Chestnut St, Oakland, CA 94607	<b>Location</b>
▶ 0.03466 acre (1,509.8 ft <sup>2</sup> )	<b>Lot Size</b>
▶ City of Oakland Redevelopment Agency	<b>Owner</b>

Prospective Location 2 Details	
▶ APN 12-969-29   3929 MLK, Jr. Blvd, Oakland, CA 94609	<b>Location</b>
▶ 0.12616 acre (5,495.5 ft <sup>2</sup> )	<b>Lot Size</b>
▶ San Francisco BART District	<b>Owner</b>

“ **Step 2 Deliverable:** A preliminary report describing the sites reviewed, the findings, and site recommendations for a mobile tiny dwelling utilizing solar PV, and an eco-sanitary (eco-san) dry toilet compost system installation. The most promising site identified in Step 2 will be recommended. Budgetary limitations will likely be the driving factor for determining the most viable sites for an installation.

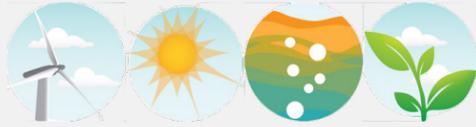


## Goals and Activities (Continued)

### 3 Tiny Dwelling and Sustainable Development Support Systems Design and Installation.

- ■ ■ ■ During the technical design stage of the project, any difficulties in construction and installation at the proposed site will be assessed. The logistics, security, availability of appropriate cover material availability for the eco-sanitary compost, system and solar insolation for the proposed site will be re-evaluated.
  - ▶ Site preparation | Police location for debris and other issues that may arise hampering the installation process.
  - ▶ Security | Establish and fortify a secure site perimeter and install security system.
  - ▶ Deliver tiny dwelling | Position dwelling optimally for best solar opportunity, to minimize any neighborhood visual impediments, and ensure a safety measures are adequately addressed.
  - ▶ Infrastructure installations | Solar PV, Eco-san Compost Processor, Grey Water Collection System, Atmospheric Water Generator, Carbon cover material depot location earmarked and delivery.
  - ▶ Stakeholder engagement | Invite local community for a tour and for feedback

“ **Step 3 Deliverable:** A summary of the steps taken to install the mobile tiny dwelling, solar PV system, eco-sanitary (eco-san) dry toilet compost system and water management system(s).

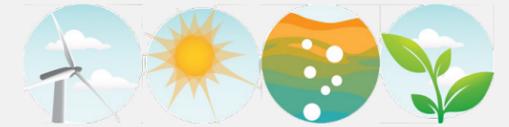


## Goals and Activities (Continued)

### 4 Detailed Analysis for Short-term Emergency Preparedness and Long-term Benefits.

- ■ ■ ■ The final analysis will provide detailed production data demonstrating the tiny dwelling inhabitant can be assured a reasonable quality of life will not be interrupted because of lack of electricity, sanitation, and water during a disaster event, or in the long-term. This period will cover a minimum of 12 months. The outcomes can become the tool and reference for engaging technical consultants in the design and construction for future locations hosting tiny dwelling inhabitants. The analysis will include the following:
  - ▶ Power generated by an autonomous photovoltaic (PV) solar system to become part of the long-term contingency planning rubric.
  - ▶ Successful, safe, eco-sanitary composting of human excreta management to be provided as a soil amendment, and carbon sequestration opportunity.
  - ▶ Grey water recovered, water harvested and generated from the atmosphere providing drinking water offsets and for hygiene.
  - ▶ 4' x 4' Raised beds prepared using re-purposed shipping pallets

“ **Step 4 Deliverable:** A final report describing the production outcomes of the autonomous, mobile tiny dwelling utilizing an off-grid renewable energy system, sanitary compost processor system, and water management systems (grey water and atmospheric water generator). This report will include the energy and water production, and the percentage of the municipal load that could be serviced through the solar energy at the respective location. Data will be compared to existing energy, municipal sanitation, and water uses for these calculations.



## Tiny Dwelling 1



**The METRO 20'x 8'4"**

*The METRO is a nod to the mid-century curved travel trailers, with aluminum siding and exposed fasteners. Designed by Patrick Sughrue.*

### EXTERNAL DESIGN

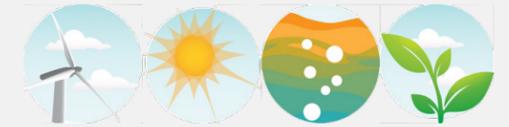
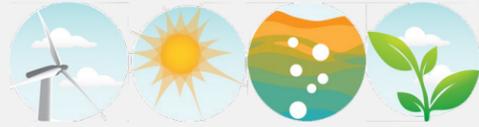
Built on a custom tiny house trailer from Great Northern in southern Oregon With two 5,000 lb. axles. Unique exterior with redwood and aluminum siding.

### INTERNAL DESIGN

The Park Model code ANSI a119.5 used as a guide for designing and building. Redwood loft and window trim. Invested \$37,000 in materials to show model reflected a commitment to green building.

### Basic Information

▶ ~8,600 lb	<b>Weight</b>
▶ 169 ft <sup>2</sup> + 45 ft <sup>2</sup> in loft	<b>Living space</b>
▶ Dry toilet, 4-1/2" Structural Insulated Panels (R16), plug-n-play all electric w/50 amp panel, LED lighting, refrigerator and freezer, 1,000-watt heater, shower, built-in storage closet	<b>Some features</b>



# Tiny Dwelling 2



**The Byron Tiny House 24'7" x 9'10"**

*Modern. The extra width combined with the generous use of windows give it a very open, spacious feel. Designed by Nadia Marshall.*

### EXTERNAL DESIGN

Architectural-profile cladding used to give this dwelling modern look. Treated with an aging stain for a more 'organic' look. Tiny eaves for the roof were incorporated to protect the windows and avoid the box-like look.

### INTERNAL DESIGN

Spacious. Ample use of glass to create a sense of continuing space. Used black to frame the windows but also the whole house to yield a Japanese framing effect.

### Basic Information

▶ ~9,000 lbs	<b>Weight</b>
▶ 343 ft <sup>2</sup> includes loft and window box	<b>Living space</b>
▶ Dry toilet, washer/dryer, shower (indoor and outdoor), built-in storage	<b>Some features</b>

# Out Think The Box is well-positioned to implement the project, because...

*...Out Think The Box is an innovative, seasoned actor and transformative change agent in renewable energy systems technologies, WASH (Water and Sanitary Health)/Ecological Sanitation (Eco-san), in the construction of agile, adaptable, attractive, sustainable, energy efficient, comfortable mobile tiny dwellings, and implementing urban agriculture opportunities.*

### Renewable Energy Systems Technologies

#### Broad-minded REST generalists

As renewable energy systems technologies (REST) generalist, local knowledge and resources are used to combine with low-cost, low technology renewable technologies, providing energy and potable water solutions for security energy supply security and disaster relief, and in the long-term. By involving community leaders, engineers, regulators and implementation, we design solutions where utility services are non-existent or expensive due to shock events, e.g. earthquakes, climate change effects, financial, etc.—empowering communities to improve their quality of life and reduce greenhouse gas emissions.

Our competitive advantage includes a strong engineering foundation, community outreach experience, awareness and a driving passion to execute real-world solutions. We bring an understanding about real-world scenarios from well-respected sustainability development and renewable energy technologies institutions.

One of Out Think The Box's designs is a hybrid PV-wind-battery-diesel systems for a telecommunications station with a 365/24/7, 1kWh/day demand for power currently met by diesel generators and transportation of diesel.

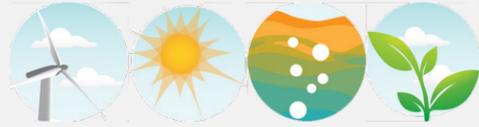
### Ecological Sanitation (Eco-san)

#### Kailash Ecovillage, IWA & US TAG ISO/PC 31800

On 07/30/2019, the City of Portland, OR **permitted** the Kailash Ecovillage Eco-san Project. For over five years, this container-based sanitation processor has successfully been turning human excreta into fertilizer for valuable foodstuffs, such as organic berries, fruits, and vegetables in this community. Affordable and easy to maintain, costing just \$200 per user per annum, and only \$50 per toilet. Western high-tech water-based sanitations systems costing \$15,000 become inoperable when the centralized sewer grid is no longer functional due to disaster-related events. A **paper** on this system was published on 09/18/2019 in the IWA Blue-Green Systems Journal.

A single user eco-san system was installed in Lake County, CA in September 2019, and recognized by the Region 5 CA Water Quality Board as being 'important and not a threat to the environment.'

Out Think The Box is a member of the US Technical Advisory Group (TAG) to ISO/PC 31800 Community scale resource oriented sanitation treatment systems—international standard group operates in the field of resource oriented sanitation treatment systems to ensure safety, performance, and sustainability of community-scale human excreta treatment serving 1,000+ people.



# Out Think The Box is well-positioned to implement the project, because...

...Out Think The Box is an innovative, seasoned actor and transformative change agent in renewable energy systems technologies, WASH (Water and Sanitary Health)/Ecological Sanitation (Eco-san), in the construction of agile, adaptable, attractive, sustainable, energy efficient, comfortable mobile tiny dwellings, and implementing urban agriculture opportunities.

## Tiny Dwellings

### Cultivating the riches of less

We have over four years of experience developing agile, adaptable, attractive low-cost mobile tiny dwellings. The design and construction of some of our smallest, lowest-cost (\$13,000-\$17,000) dwellings that are sustainable, affordable, and beautiful, can offer temporary/transitional homefulness solutions. These solutions are affordable to the masses and conserve the Earth's resources without sacrificing beauty.

On November 2018, a Single-user Eco-San Dry Toilet System Feasibility Proposal was submitted to [District Two City of Berkeley Councilwoman Cheryl Davila](#). This overview document provided a proposed approach to develop a viable strategy for siting and installing an autonomous tiny house on City of Berkeley property. The ultimate aim of this document was to serve as a catalyst for appealing to funding of a place-based initiative to develop innovative rubric in preparation for an uncertain, unstable climatic future

On February 2019, [CA Assemblymember Rob Bonta](#) and [CA State Senator Nancy Skinner](#) requested a tiny dwelling pilot. [CA State Senator Nancy Skinner's](#) office also requested language for inclusion in a prospective bill to support this endeavor.

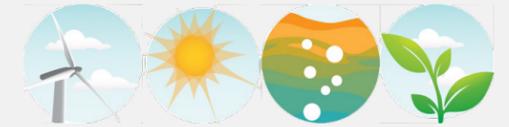
## Urban Agriculture

### Urban farm stewarding

Equipped with over fifteen years of multidisciplinary knowledge, and a foundation in focused rural and urban organic farming practices, we are able to provide a big picture, sound, pragmatic, and as-green-as-possible recommendations for urban farming applications.

As far as cultural sensitivities go, we are adept at identifying and acquiring a better understanding of the landscape and culture to equitably service and train all stakeholders who may become involved. This way, an environmentally and socially accountable and equitable end can be ultimately achieved in urban environments for deploying hyper-intense/bio-intense urban farms on vacant lots.

So far, this past season's harvest in Eldorado County, CA has yielded ~1450 lb. of produce i.e. tomatoes, peppers, lettuces, chard, squash, potatoes, and fruit (apples, pears, persimmons, pomegranates, citrus, olives).



# Outcomes

*Outcomes expected that will be realized as a result of the REST in Urban Agriculture + S.E.E.C. Home Project work proposed*

## Benefits

▶ <b>Energy security</b>   Renewable energy systems technologies (REST) ensure the lights stay on when the grid is offline	<b>Opportunity 1</b>
▶ <b>Sanitation security</b>   Safe, sustainable ecological sanitation (eco-san) yielding carbon sequestration opportunities	<b>Opportunity 2</b>
▶ <b>Water security</b>   Rain water and grey water reclamation/recovery, and atmospheric water generator potable offsets	<b>Opportunity 3</b>
▶ <b>Food security</b>   Locally grown, hyper-intense/bio-intense urban agriculture	<b>Opportunity 4</b>

## Solutions services offering summary

The purpose of this offering is to provide services for Sustainable Energy Efficient Comfortable (S.E.E.C.) tiny dwellings by providing resilience, redundancy, and robust services in:

- **Energy** | Fortifying the energy security of the tiny dwellings by installing renewable energy systems technologies (REST e.g. solar PV. This ensures when the grid goes down, the tiny dwelling inhabitants will be well-positioned to be self-supporting during an unexpected disaster event, taking stress off of local municipalities. This will also allow the community neighbors to have access to electricity to power portable devices e.g. cell phones, laptops.
- **Sanitation** | Safe, sustainable ecological sanitation (eco-san) is used for decomposing and repurposing humanure/human excreta resources to fortify nutrient cycle for eventual use as a soil amendment AKA carbon sequestration.
- **Water** | Rain water and grey water reclamation/recovery, and atmospheric water generators provide for hygiene and drinking water, as well as supporting hyper-intense/bio-intense urban farms.
- **Food** | Ready access to locally grown produce.

Out Think The Box aims to provide self-sustaining, agile, adaptable tiny dwellings/homes to currently un-housed (and those who may become unhoused during disaster events) that are inSTEAD of homelessness, which can take stress off the municipality infrastructure. We have developed a STEADfast alternative to the streets, providing someplace STEADY in the middle of disaster, and for long-term, sustainable quality of life needs—*Everyday Brilliance for Disaster Resilience*.

