Renewable Energy Testing Center
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California Energy Commission
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California Energy Commission
Docket Office, MS-4
Re: Docket No. 12-EPIC-01
1516 Ninth Street
Sacramento, CA 95814-5512

Technikon Inc. is a non-profit company located in the Sacramento area that operates the U. S. Army's Renewable Energy Testing Center (RETC). Technikon attended both days of the Northern California EPIC program Investment Planning Meetings. We are very interested in helping CEC's advancement of renewable power in California by providing comments about a Department of Defense approach that has a demonstrated track record for cost effectively advancing near-commercial technologies.

We would like to supply comments for consideration of the Commission as they determine a strategy for funding the acceleration of renewable energy programs to commercialization. But first we would like to cover the background on our program and then in comment section, supply a few recommendations.

RETC Background:

- The RETC's 60,000 sq. ft. R&D, test and validation center is located in Sacramento, CA and has been operated by Technikon, Inc. (a non-profit company) since 2008. The model explained in Comments has been used by the Defense Department in other emerging technology areas since 1997.
- Program receives funding from various sources:
  - U.S. Army for support of renewable for DOD applications
  - State and Federal Grants
  - Private testing contracts

History:

- Program has hadCongressionally fundingto start the center
- RETC focused on supporting smaller startup companies by providing site for development, testing and validation services
- More permitted pilot renewable technologies are currently in testing on site than any

other known facility in the US.

- Five gasification waste conversion technologies have been tested – 4 of 5 have been successful in selling commercial units; 1 to DoD - a 40 tpd day MSW system for the Army's Fort Irwin
- Twogasification to liquid fuel technologies tested – one company received $19 Million DOE grant to build demonstration plant based on RETC data.
- One microwave based waste conversion system tested at RETC has received CEC contracts and has recently installed system at Edwards Air Force Base.

- One algae carbon sequestration technology has also been tested at the RETC and is installing system in San Jose area.
- Five start-up companies that were tested and validated at RETC have received a total of over $30 million in outside funding with an equivalent amount in private investment. Most recently, Sierra Energy Corporation has received a $5M CEC grants.
- Two new companies are planning to use the RETC as test site with their CEC grant funding.

- **Comments:**

This successful approach is one based on targeting those waste and biomass renewable energy companies that are at the latter stage of the "valley of death" pre-commercialization and have gone through traditional incubators to teach the developer/entrepreneur about building a business. The technology groups have built their technology components but are a point where they need the industrial scale integration support and data measurement, in order to validate their university or smaller pilot claims.

The approach that CEC could use based on the military's experience is to create those industrially equipped "Centers" and focus their resources on helping the entrepreneurs that have moved past research and are trying to get the data and validation that they need in order to convince investors that their technology can do what they claim at the scale that has value to industry.

There are three significant side benefits that come from this approach and they are all necessary to foster a robust commercial acceptance of the industrial scale waste and biomass renewable energy technologies. The first is the standards for performance measurement for both the equipment and processes. The second is the environmental and performance data that is critical to being able to permit use of the technologies in California. The third is the new safety and human factor standards that will come from evaluating the new technologies in a controlled environment.

An industrially outfitted center will have infrastructure designed for a particular new technology group. This would include the heavy equipment and appropriate testing environment targeted for the technology space. When governments give money to development the pre-commercial technologies without having this capability, a high percentage of the funding goes to repeatedly recreating or purchasing this access.

Model Advantages:

- California does not have to pick winners and losers by paying for near-commercial technologies
- Most waste and biomass technologies are one of many old and new technologies upstream and downstream that have to be integrated in order to have economic value
- The program does not purchase new technology equipment – technology suppliers must supply their own equipment
- The industrially equipped testing and validation center will provide "plug and play" upstream and downstream technologies
- RETC is a public private partnership between government, industry, universities and technical associations but the focus and guidance should come from the industry that will be purchasing and using the new technologies.
- Creates standardized measurement and data for accurate comparisons
- Accelerates renewable energy technology commercialization
- Increases the number of technologies evaluated and also reduces the time period for testing
- California will gain the reputation for creating the body of data and standards that define an emerging industry for waste and biomass to energy
- Draws domestic and international technologies to California and creates jobs for the state

We propose a new funding model for the EPIC program that would support programs such as the RETC with funding to test and validate "X" number of technologies per year. Instead of micromanaging each grant for each company the incubator program works off a set budget per year. TheCenterand the technology developers would supply quarterly reports to the CEC as to the status of the technology and results to date.

Technology providers would be reviewed and approved by CEC based on input from a Center Committee made up of high-level individuals representing the industry that is the ultimate consumer or driver for purchasing the technology. The CEC monies would be used to support the set up of equipment, R&D, Testing and Validation, and reporting of the technology.

CEC would not buy any equipment or pay any technology providers salaries. The funding would cover the prorated (depending level of CEC funding versus other funded testing) on operational

expenses of the Center: a) Facility costs, rent, utilities, insurance, etc. b) staff expenses, c) direct materials, d) ODC, e) Travel - offsite testing is possibility, f) outreach, etc.

This incubator approach would attract other larger industrial, utilities, Universities, and R&D labs and companies to partner on projects. EPRI has been to site and is signing up to support R&D testing at the RETC when it falls into to their mission. SMUD has been involved in multiple projects with companies at the RETC. UC Davis and Sac State been part of grants or have supplied interns to the RETC in the past few years.

CEC Specific Questions:

1. What are the benefits of innovation clusters in supporting the development and deployment ofinnovative clean energy technologies?
   - See Model Advantages listing above – the RETC model has shown that this approach works, is needed and transitions technologies from the R&D stage thru the "Valley of Death".
2. What are the pros/cons of the different models of energy innovation clusters to accelerate asuccessful path to market? (i.e. Technology Incubators, Innovation Hubs, Centers of Excellence)
   - Each have place and are needed. The industrial technology incubator for renewable energy is the final step in the support process for emerging energy technology companies.
3. Do you recommend funding for innovation clusters in the EPIC Program? Provide programspecific recommendations.
   - Yes we support the concept of innovation clusters if they include the industrial incubator as partner in the process. See comment section for specific recommendations
4. If this is meritorious for funding, how should EPIC measure ratepayer benefits for energyinnovation clusters?
   - The measurement or rating would be base on the number of technologies carried by the program per year and the success of commercializing the technology.