

03/03/14

**Presentation:  
Merged Energy  
Solutions -  
Multi-  
Industrial  
Greenhouse  
Facility and  
Transforming  
Alaska**

<TARGET><BILL></BILL><SUBJECT>03-03-14 Presentation Merged Energy Solutions - Multi- Industrial Greenhouse Facility and Transforming Alaska</SUBJECT><COMM>HEDT28</COMM></TARGET>

# Alaska State Legislature

Representative Shelley Hughes, Chair

Session Address:

Alaska State Capitol, Room 409  
Juneau, Alaska 99801-1182  
Phone: (907) 465-3743  
Fax: (907) 465-2381  
House District 8



Representative Lynn Gattis  
Representative Bob Herron  
Representative Pete Higgins  
Representative Craig Johnson  
Representative Kurt Olson  
Representative Lance Pruitt  
Representative Harriet Drummond  
Representative Geran Tarr

## *House Special Committee on Economic Development, Trade and Tourism*

To: House Economic Development, Trade and Tourism Committee Members

From: Representative Shelley Hughes, Chair

Date: February 26, 2014

Re: Committee Schedule for the Week Beginning March 3, 2014

---

The House Special Committee on Economic Development, Trade and Tourism (EDT) meets in the Barnes Room 124, on Tuesdays and Thursdays from 11:15am to 12:45pm.

**Monday, March 3, 2014** 8:00am in Room 124 (note time and date)

Joint meeting with House Special Committee on Energy

+ Michael Smith, CEO Merged Energy Solutions

Kurtis Zell, Development Coordinator

“Multi-Industrial Greenhouse Facility” and “Transforming Alaska”

**Tuesday, March 4, 2014** 11:15am in Room 124

No meeting scheduled

**Tuesday, March 4, 2014** 1:00pm in Room 124 (note time and date)

Joint meeting with House Transportation Committee

+ Michael Smith, CEO Merged Energy Solutions

Kurtis Zell, Development Coordinator

“Transforming Alaska”

**Thursday, March 6, 2014** 11:15am in Room 124

No meeting scheduled

+ Teleconferenced

## Ginger Blaisdell

---

**From:** Katherine Eldemar  
**Sent:** Wednesday, February 26, 2014 12:02 PM  
**To:** Ginger Blaisdell; Jeff Turner  
**Subject:** RE: presentations for (H)ENE  
**Attachments:** ENE Committee - Joint Committee Meeting - Notice - March 3-7, 2014.doc

Hi Jeff,

Rep Hughes is the lead on this joint hearing between the Energy committee and the House Special Committee on Economic Development, Trade and Tourism. Ginger has been great organizing the details for the presenters and has shared their PowerPoint presentation and agenda. As we discussed, the presenters are not able to be here in person but their pending business contract with Douglas is constraining their travel.

Here is the draft Energy committee agenda for the week March 3-7, 2014. The joint meeting language mirrors the House Special Committee on Economic Development, Trade and Tourism. It needs to be filed today with the Clerk's office so when my boss is done with session I will have him review the draft agenda. Your thoughts?

Thanks,

*Katherine Eldemar*

Committee Aide  
House Special Committee on Energy  
Rep. Doug Isaacson  
House District 1  
[katherine.eldemar@akleg.gov](mailto:katherine.eldemar@akleg.gov)

(907) 465-4936 direct line

---

**From:** Ginger Blaisdell  
**Sent:** Wednesday, February 26, 2014 11:27 AM  
**To:** Katherine Eldemar  
**Subject:** presentations for (H)ENE



**MES**

MERGED ENERGY SOLUTIONS

**Merged Energy Solutions  
Multi-Industrial Greenhouse Facility**

# Vision and Mission

---



***Generating tomorrows growth today***

## Mission Statement

Our mission is to **renew** and **build** a sustainable Earth by **empowering** and **educating** people throughout the world. We **collaborate** with **nature**, **technology**, and people to create sustainable **energy** and **food**. We realize our vision by committing **cutting-edge** technology, building **state-of-the-art** clean energy and agriculture projects, and **investing** in the **education**, **health**, and **well being** of **people** throughout the **world**.



MERGED ENERGY SOLUTIONS

# Multi Industrial Greenhouse (MIG)

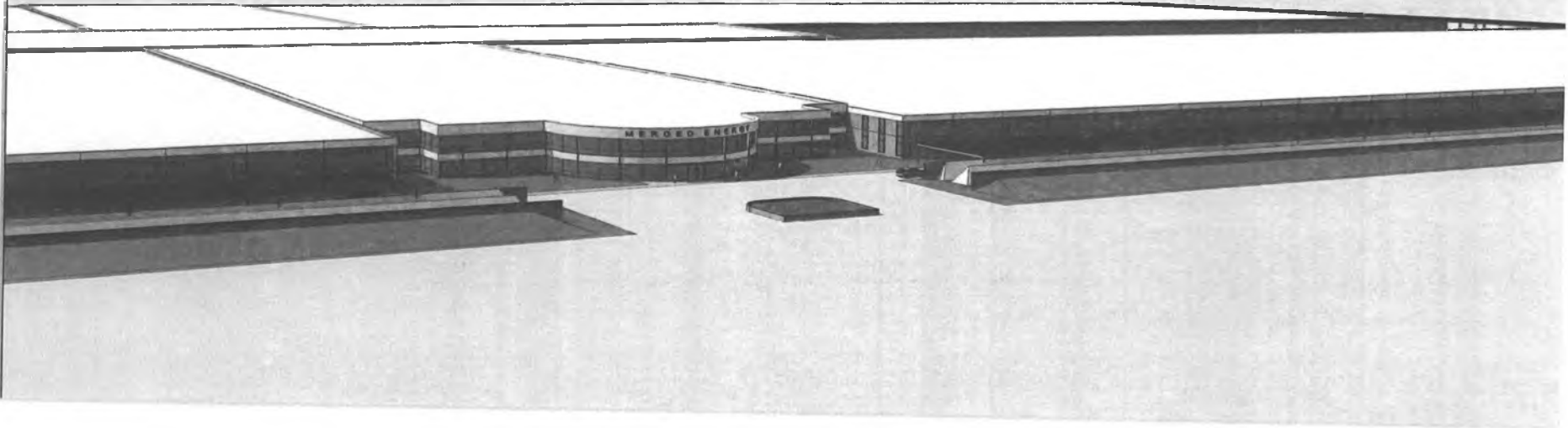
---



# MES

MERGED ENERGY SOLUTIONS

MERGED ENERGY SOLUTIONS



MERGED ENERGY SOLUTIONS

# Multi Industrial Greenhouse (MIG)

---

## Components

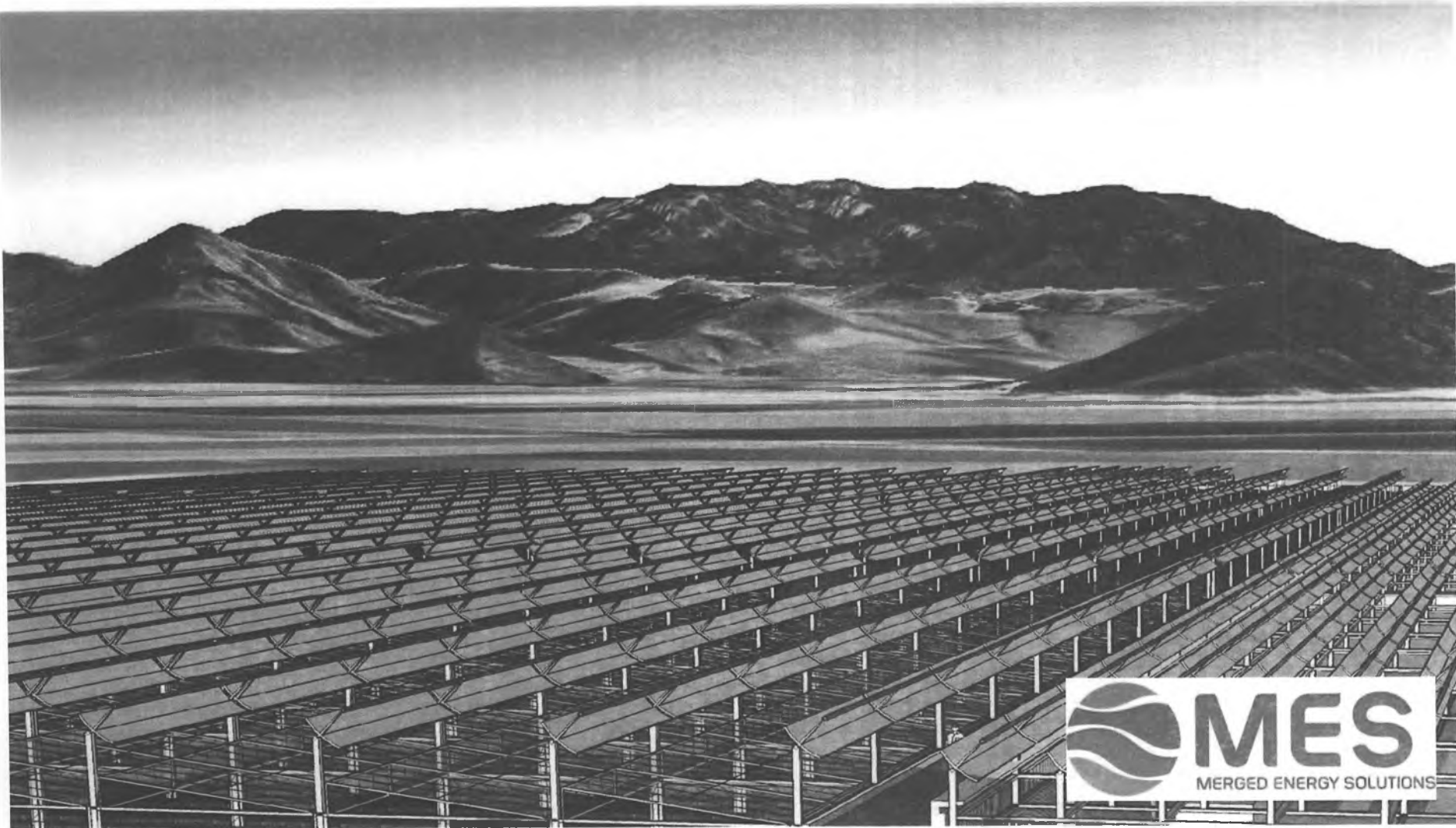
- Concentrating Solar Thermal
- Advanced Biomass Gasification (ABG)
- Geo Thermal
- High-Density Vertical Farm
- Aquaculture
- Water Desalination & Purification
- Academy of Advanced Technical Science



MERGED ENERGY SOLUTIONS

# Concentrating Solar Thermal

---



# Why Concentrating Solar Thermal?

---

## The Process

A Concentrating Solar Thermal Roof (**CSTR**) produces electric power by converting the sun's energy into high-temperature heat, which is then channeled through a conventional generator.

## Efficiency

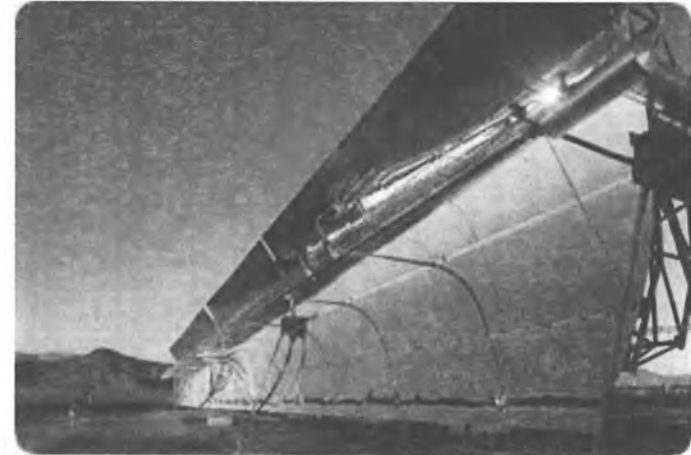
The CSTR is one of the most efficient and dependable producers of solar energy available today. The CSTR is rated at **34-38% efficiency** in terms of translating the direct solar energy to electricity and has a useful life of 50 years.

## Heating & Cooling

The thermal energy can also be used directly for heating and cooling purposes; running it to absorption chillers for cooling and a heat exchanger for heating.

## Energy Storage Capability

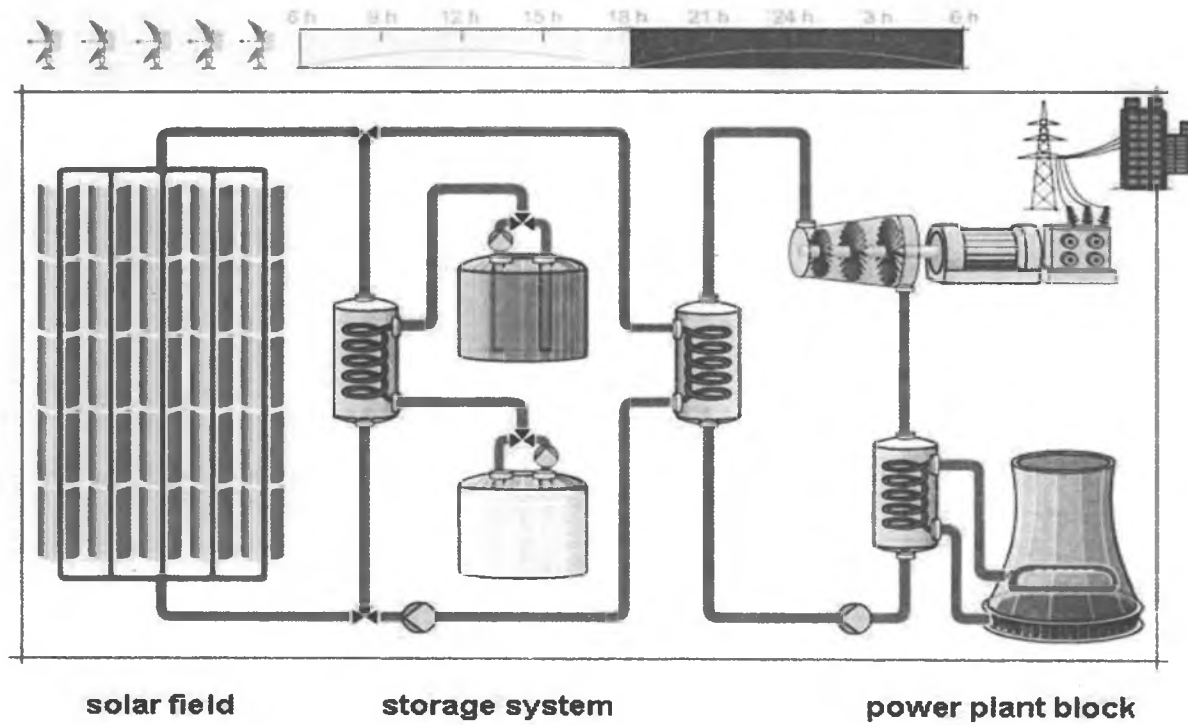
Trough designs can incorporate thermal storage—setting aside the heat transfer fluid in its hot phase—allowing for electricity generation several hours into the evening.



MERGED ENERGY SOLUTIONS

# Concentrating Solar Thermal

## How it Works...



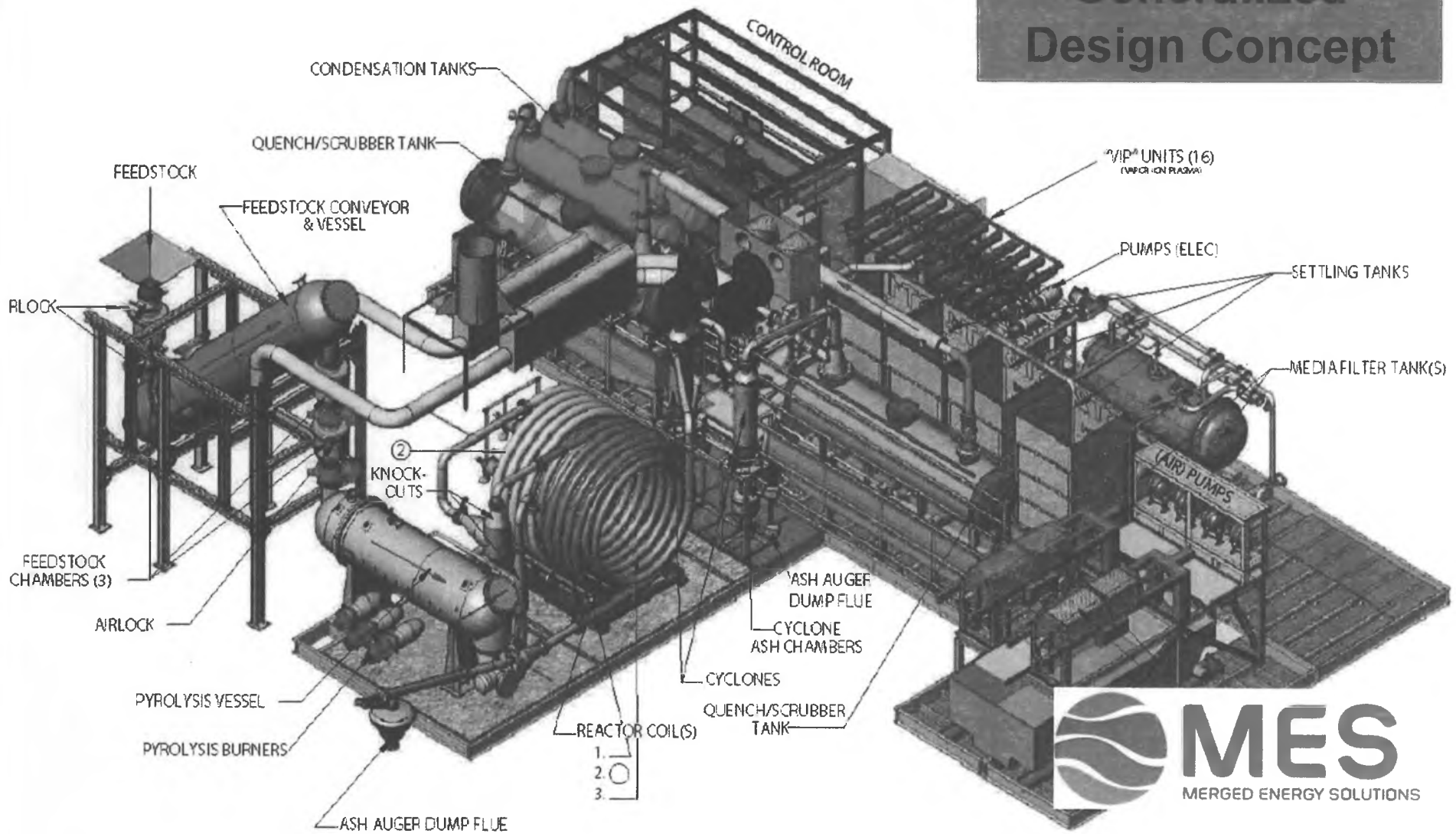
# Advanced Biomass Gasification (ABG)

---



# Advanced Biomass Gasification (ABG)

## Generalized Design Concept



# Advanced Biomass Gasification (ABG)

---

## Products

### Syngas

- Electricity
- Synthetic Diesel

### Ash

- Soil Conditioner

### Purified Water

## Feedstock

- Agricultural or Municipal Waste
- Low Feedstock Cost
- Plant Adaptable to Any Location



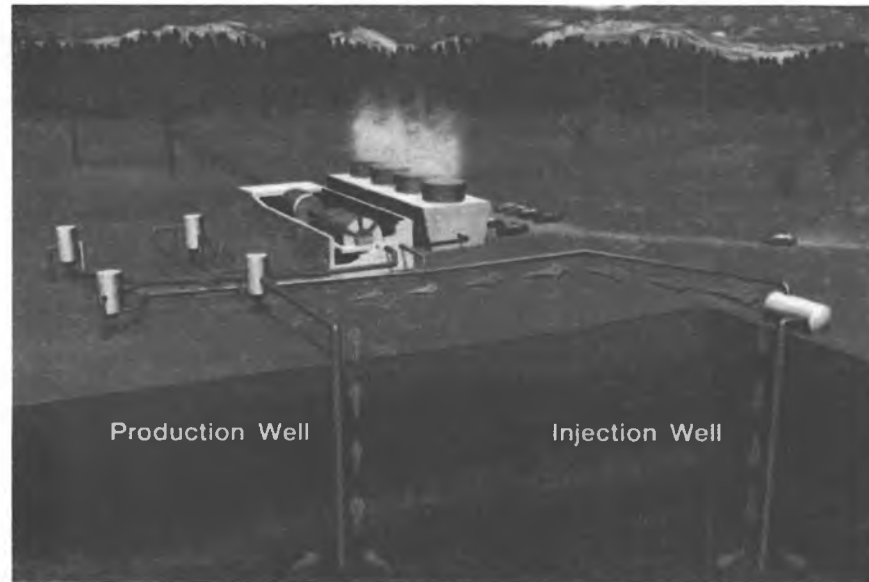
MERGED ENERGY SOLUTIONS

# Geo-Thermal

## Hydrothermal Power Systems

There are three geothermal power plant technologies being used to convert hydrothermal fluids to electricity - **Dry Steam**, **Flash**, and **Binary Cycle**. The type of conversion used depends on the state of the fluid (whether steam or water) and its temperature.

**Flash steam** plants are the most common type of geothermal power generation plants in operation today. They use water at temperatures greater than 360°F (182°C) that is pumped under high pressure to the generation equipment at the surface. Binary cycle geothermal power generation plants differ from Dry Steam and Flash Steam systems in that the water or steam from the geothermal reservoir never comes in contact with the turbine/generator units.



**Dry steam** power plants systems were the first type of geothermal power generation plants built. They use the steam from the geothermal reservoir as it comes from wells, and route it directly through turbine/generator units to produce electricity.



MERGED ENERGY SOLUTIONS

# Power Generation - Summary

Between the **Concentrating Solar Thermal, Bio-Mass, and Geo-Thermal** outputs, a 150 acre MIG facility can generate **20 to 40 megawatts** of power. The MIG would consume approximately 3 to 4 megawatts.

One (1) megawatt will provide **power for approximately 2,400 average-sized homes**. This means an average of **28,000 to 85,000 homes** can be serviced by one facility, and can be taken off the power grid.

This is important when it comes to security because by being **independent from the grid**, earthquakes, tsunamis and other natural or man-made disasters will not impede the MIG from producing energy, water, fresh produce and fish .



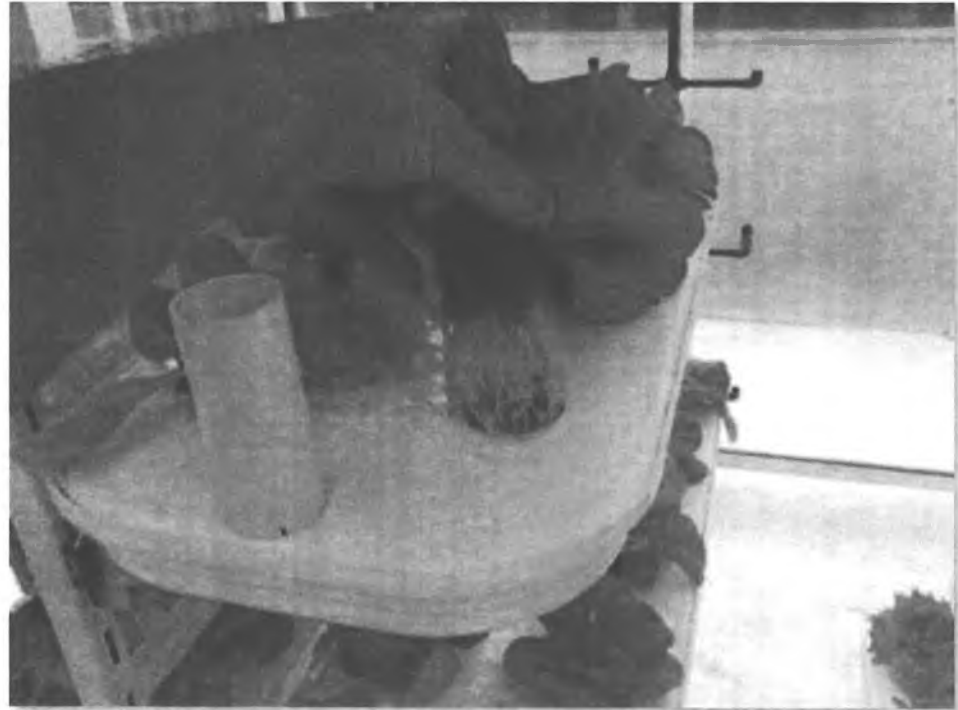
MERGED ENERGY SOLUTIONS

# Advanced High-Density Vertical Farming

---

The **Advanced High-Density Vertical Farming (AHDVF)** or hydroponic growing system does not use soil. The crops are either suspended in water or a water mist is periodically sprayed on the plant root structures of the crops. The water is infused with nutrients like those naturally found in the soil.

**This system uses no pesticides or fertilizers** in this growing environment. Additionally, for example, bees will be introduced into the system to provide a natural pollination cycle. Unlike any genetically modified organisms (GMOs), the seeds are free of any genetic alterations and use only a natural nutrient solution that will allow for organic certification of all the produce.



MERGED ENERGY SOLUTIONS

# Advanced High-Density Vertical Farming

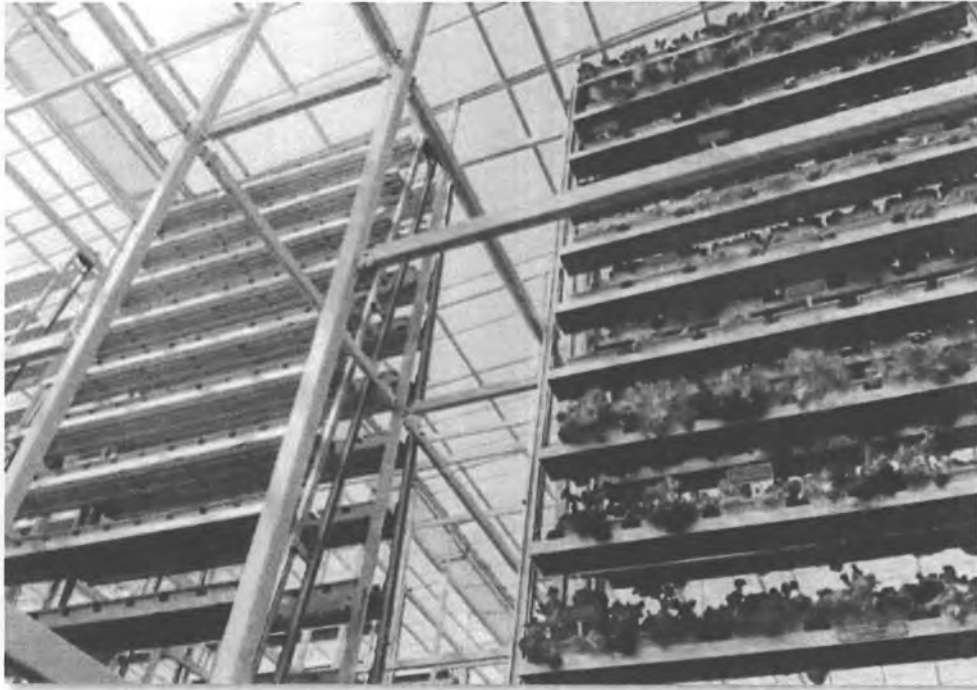
The current generation of hydroponic greenhouse technology in North America produces fresh tomatoes, bell peppers & cucumbers in sufficient quantities to market all over the country. The **MIG System** offers immense variety over and above that current level and type of production, including lettuce, herbs and some fruits, such as strawberries.

Quadrants of each greenhouse may be organized to maintain a specific growing environment, which will support the crops suited to that environment. The diversification of production will allow for a more balanced and complete produce offering to suit each market served.



MERGED ENERGY SOLUTIONS

# Advanced High-Density Vertical Farming



The annual production level of the ADHVF described here is projected, at normal operation, to be approximately **90 million pounds** - enough produce to feed an average **population of 300,000 people** or **60,000 families**.



MERGED ENERGY SOLUTIONS

# Water Desalination

---

MES recognizes that, today, **water** is a **precious commodity** and with water shortages around the world, it is essential that we are aware of how we can best utilize our resources.



With this in mind, we have created a water treatment system known as Alpha Water that will desalinate, reclaim, purify and produce over **one and a Half million gallons** per day for use by the MIG and for neighboring city use.

By incorporating this **critical element**, we are reducing the amount of water that we use in our facility (or take from other users) and that we are producing the **highest quality** drinking water possible.



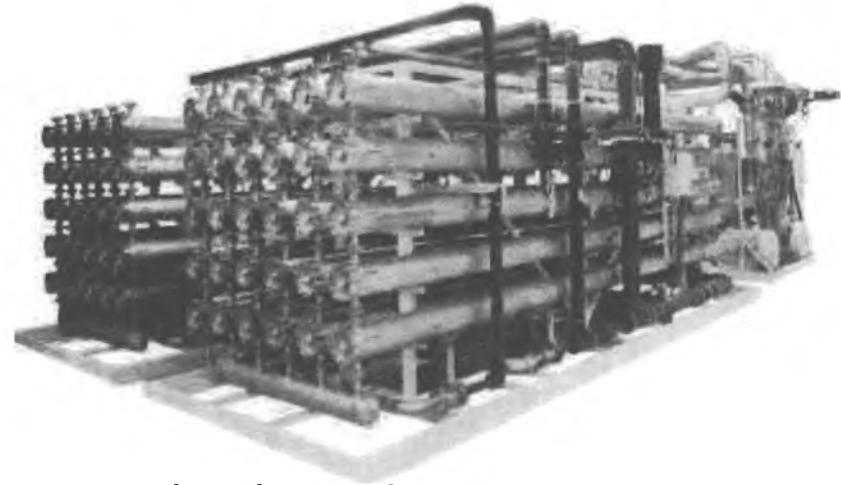
MERGED ENERGY SOLUTIONS

# Water Purification

---

## Applying the Technology

Until now, no one desalting process has **proven itself** as “the best.” A variety of factors have come into play in choosing the appropriate process for a particular situation.



These factors include the quality of the source water, the desired quantity and **quality of the water produced**, pre-treatment, energy and chemical requirements, and methods of concentrate disposal. MES, however, has developed the most **advanced and unique** system, *regardless of the water source*, by applying additional multiple-step **procedures**, including the use of quantum mechanics and a plasma bioreactor system. Due to the proprietary nature of this process, it is not detailed in this presentation.

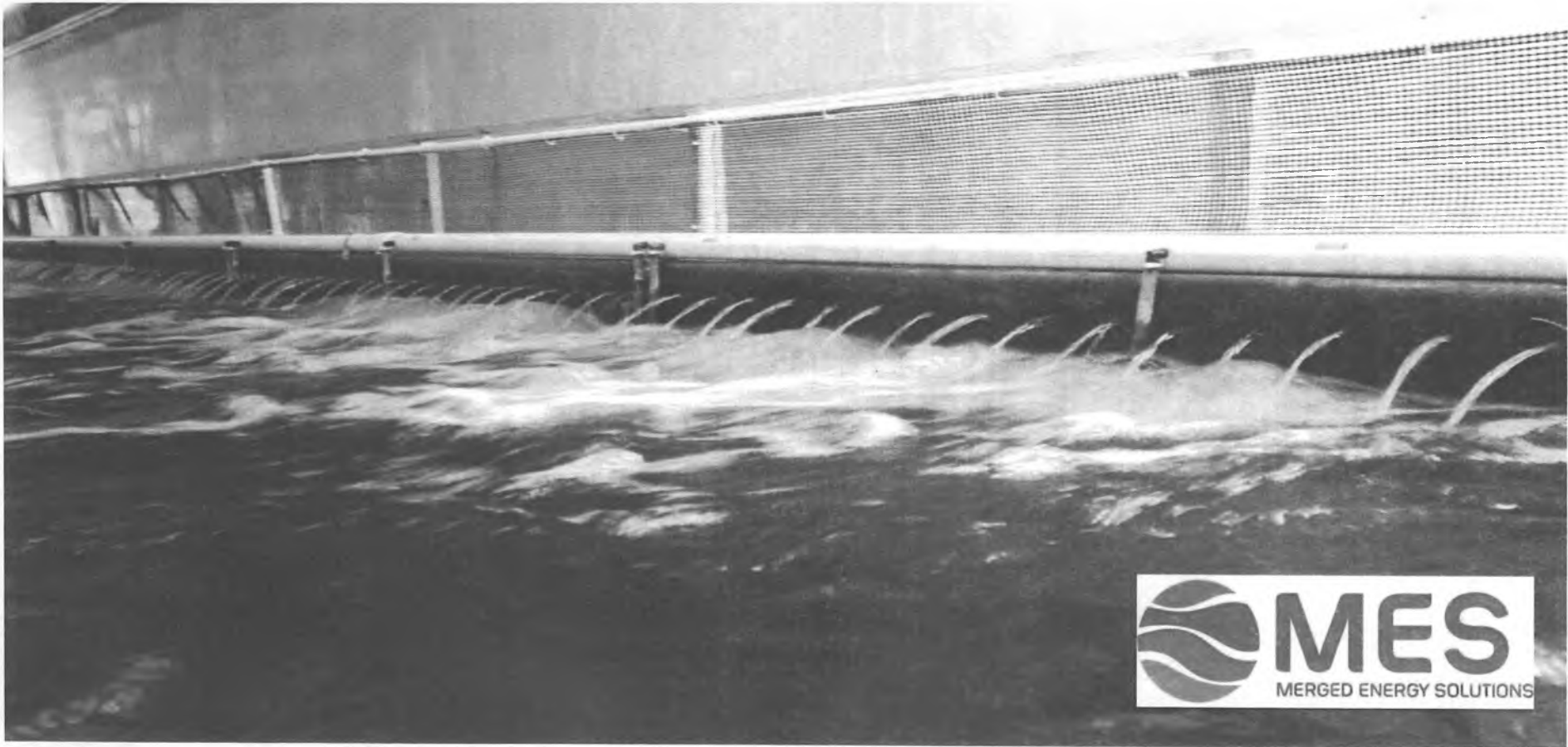


MERGED ENERGY SOLUTIONS

# Aquaculture: Opposing Flow Technology

---

The unique and patented “Opposing Flow” technology depicted below also creates a continual current in the culture tank. After the biofilter, the purified water is evenly distributed back into the culture tank, entering from both sides of the tank **causing the fish to align themselves** in the current, constantly swimming “upstream” facing either side of the 40’ long tank. With this constant swimming motion, **the fish can metabolize the high protein feed into flesh which produces a higher yield**, compared to fish grown in circular aquaculture tanks.



# Why Produce and Fish?

---

Prior to the early twentieth century, virtually all produce grown was what we now consider organic. No pesticides were used and the only fertilizer available was natural and nutrient rich manure and biodegraded foliage. The soil was also rich from years of continued farming. At that time, the variety of produce varied greatly – for example, there were some 4,000 varieties of potatoes and approximately 7,000 varieties of apples in the 1800s. Today, we are lucky to have maybe four different varieties of potatoes and apples commonly available.

After World War I, agriculture started using nitrogen fertilizer in mass quantities - a development derived from the nitrogen explosive used in bombs – to increase crop production. If that wasn't enough, we developed DDT from poison nerve gas to use as an insecticide.

By the mid 20th century, we moved into the period called the “Green Revolution” which was an attempt to **systematize the growing industry and increase food production**. However, this led to the dramatic **reduction in variety, often to a single crop type, causing further vulnerability to insects and disease**. **With more insects and disease**, the industry was forced to use more pesticides. This ultimately led to the Genetically Engineered seed that would be resistant to the pesticides.

All this engineering of nature's bounty is clearly not a positive development. One prime example of the negative effects of this process is the tomatoes today. These vegetables may be big and red, but they lack the taste and nutrients of naturally-produced tomatoes.



MERGED ENERGY SOLUTIONS

# Why Produce and Fish?

## Continued...

---

The same companies who developed the most common pesticides were also the first companies to patent the first genetically engineered or genetically modified organisms (GMOs), seeds that were immune to the pesticide.

Our obesity problem today is not necessarily based primarily on inherited genes and/or our poor eating habits. Rather, the prevalence of GMO products being grown under specific control have lost most of their nutritional value; in order for the human body to obtain its required nutrients, a person must eat more. In turn, by eating more we are taking in excessive calories, which turn to fat and, hence the contribute to the proliferation of obesity.

**It is time we get back to basics...** The **Advanced High Density Vertical Farming System** that is an integral part of the MIG System, is designed to grow these vegetables **the way nature meant them to be grown**, with all the nutrients and great taste and without any type of GMO or pesticide use. This is especially **important for the health and well-being** of the younger generation and for the generations to come.



MERGED ENERGY SOLUTIONS

# Why the Combination?

---

**Reduced Land Area** – Commercial-scale greenhouses produce as much as **30 times the yield** of conventional agriculture. That means a 100-acre greenhouse is equal 3,000-acres of horizontal farming production.

**Reduced Water Consumption** - Produce grown in a Multi Industrial Greenhouse (MIG) requires **10% of the amount of water** that conventional agriculture consumes. This is primarily due to the technology and management systems employed in the system.

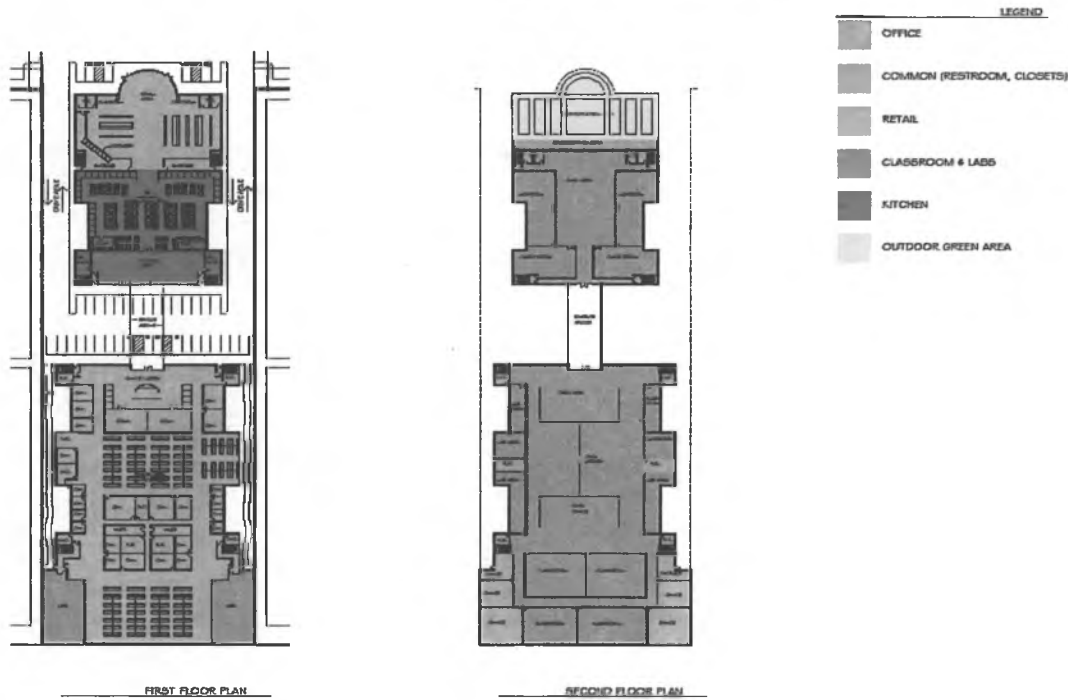
## **The Synergies of Combining Solar, Geo-Thermal and Bio-Mass**

**Energy Systems** – Combining these creates particularly high levels of heat, which is required to make steam. This steam drives a turbine that generates electricity. The high-heat generation of the combined system significantly reduces the initial capital costs of the system. Also, while the solar or geo-thermal system is operational during daylight hours, the system requires less bio-mass to fuel the system.



MERGED ENERGY SOLUTIONS

# Academy of Advanced Technical Science (TAATS)



Merged Energy  
Solutions

CONCEPTUAL FLOOR PLANS - 120 ACRE

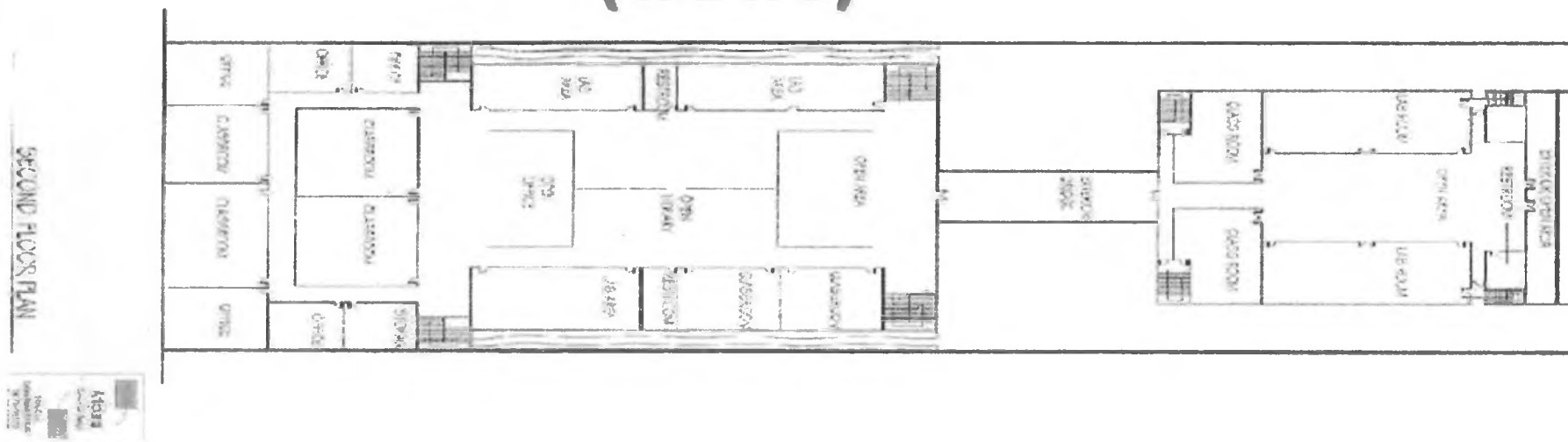


## Academy of Advanced Technical Science



MERGED ENERGY SOLUTIONS

# Academy of Advanced Technical Science (TAATS)



The Academy of Advanced Technical Science (**TAATS**) will be a **120,000 square-foot institute** located on the second floor of the main MIG facility.

TAATS will be devoted to **teaching students** of all walks of life the importance of combining the latest technology with a variety of applications such as agriculture, farming, water treatment, alternative energy, and sustainability, to name just a few.

It is our belief that in order for the younger generation to thrive they must become proactive in **creating new strategies to enhance mankind's general advancement**. We will provide that training and **encourage creative thinking to bring new technologies to life**.

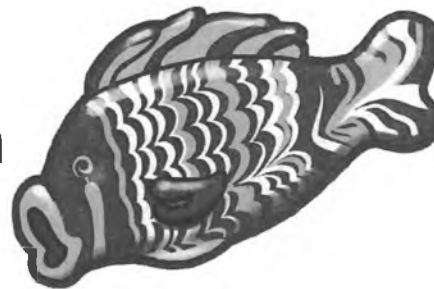


MERGED ENERGY SOLUTIONS

# MIG Production – 120 acre

## Annual Production

- **9 million** gallons Synthetic Fuel
- **40 MW** Electricity
- **90 million** pounds Organic Produce
- **5 million** pounds Fish
- **1.5 million** gallons Potable Water per day



# MIG Employment

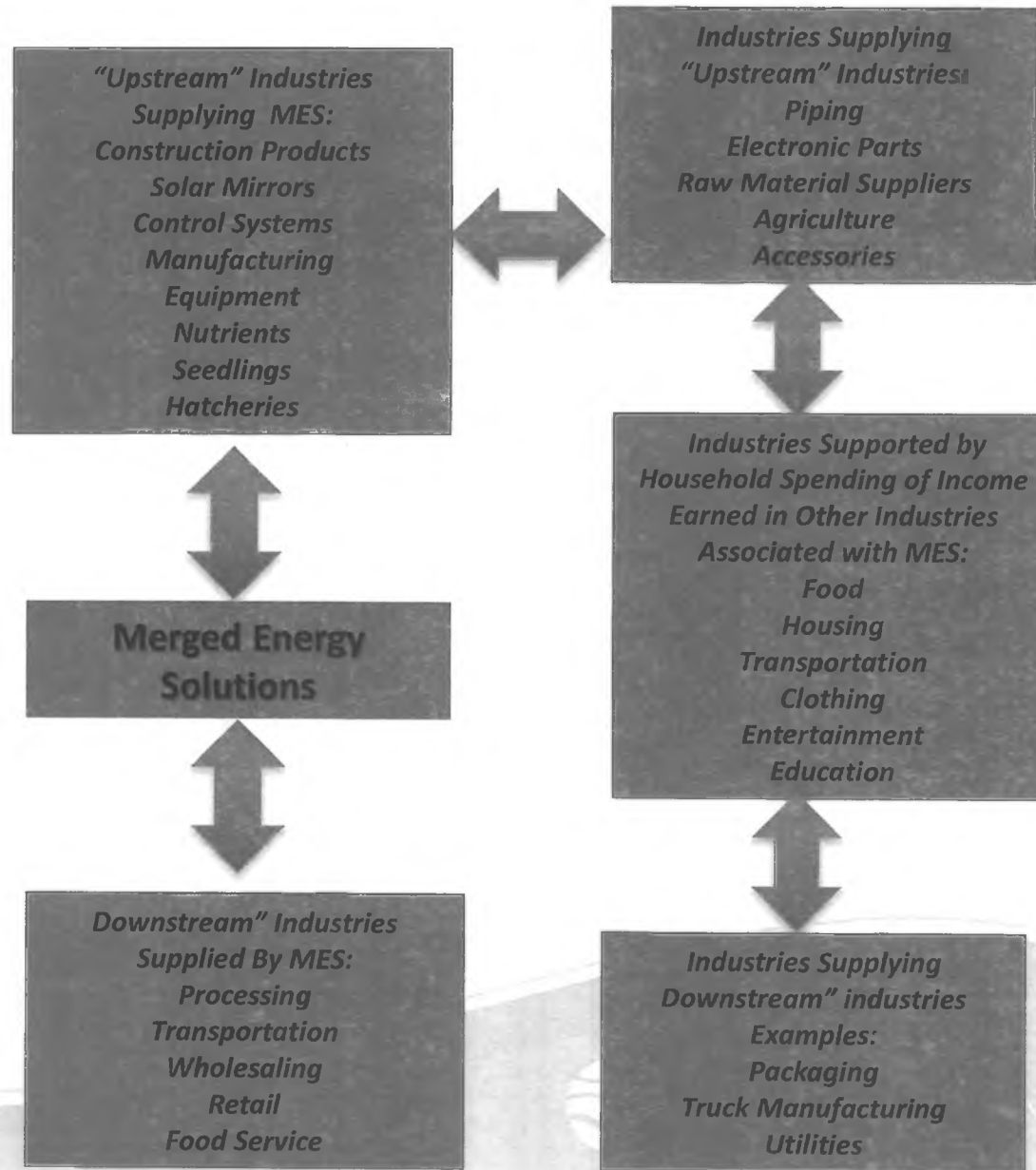


## Number of Employees



■ Water :	20
■ Bio-Mass:	25
■ Solar:	25
■ Greenhouse	300
■ Packing	80
■ Sales & Mktg	20
■ Trucking	20
■ <u>Aquaculture</u>	50
<b>Total</b>	<b>540</b>

Employment is based on the averages for the type of industry and the size of the facility. These figures are also based on the facility operating 24 hrs a day, 7 days a week and 50 weeks out of the year. This does not take into account the branch jobs created up stream. The anticipated wages for this facility are estimated at \$12 to \$20 per hour, excluding upper management and technical positions.



# Contact Us



**R. Michael Smith – CEO**

**Los Angeles, California**

**Phone: +1-714-262-6839**

**email: [michael@mergedenergy.com](mailto:michael@mergedenergy.com)**



MERGED ENERGY SOLUTIONS

# TRANSFORMING ALASKA

THROUGH INOVATIVE TECHNOLOGIES IN:  
AVIATION, RE ENERGY, SUSTAINABLE FOOD,  
CLEAN WATER, BIO FUELS AND  
HARDENED DATA CENTERS



# BENNEFITS TO ALASKA

- \* **ECONOMIC GROWTH**
- \* **LOWER OPERATING COSTS Vs FIXED WING**
- \* **MORE PRODUCTIVITY**
- \* **NEW JOBS**
- \* **SAFER TRANSPORTATION**
- \* **EXPANDED COMMERCE DOMESTIC & INTERNATIONAL**
- \* **CLEANER ENVIRONMENT**



# ECONOMICS

- \* **MINING**
- \* **ALTERNATIVE SHIPPING**
- \* **OIL AND GAS**
- \* **ALTERNATE TRANSPORTATION**
- \* **SURVEILLANCE AND MAPPING**
- \* **ON THE SPOT MEDICAL RESPONSE**



# ECONOMICS

- \* **TOURISM INDUSTRY**
- \* **DISASTER RELIEF**
- \* **SEARCH AND RESCUE**
- \* **FISHING**
- \* **FIRE FIGHTING CAPABILITIES**
- \* **TIMBER / LOGGING INDUSTRY**



# MINING



## Infrastructure Costs

- Roads
- Rails
- Power
- Equipment
- Trucks
- Earth movers



# SHIPPING - TRANSPORT



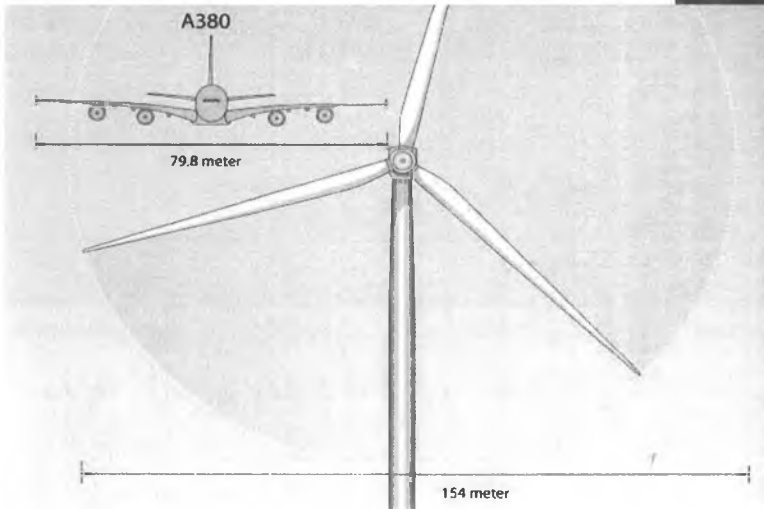
# ICE ROAD TRUCKING

Ice roads are a common feature across Alaska & Canada, and are typically the only way to access the most remote communities via ground transport.



# SPECIALTY TRANSPORT

B75 Quantum Blades are solid one-piece and 187 ft. long!



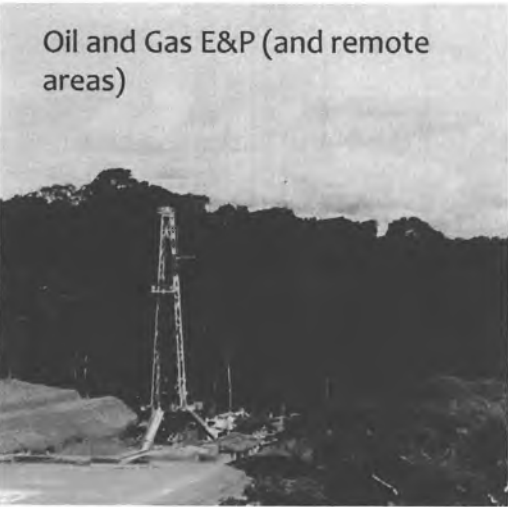
Each blade weighs about 25 tons



# IT'S ABOUT THE PAYLOAD, AS WELL AS THE PLATFORM



Transportation

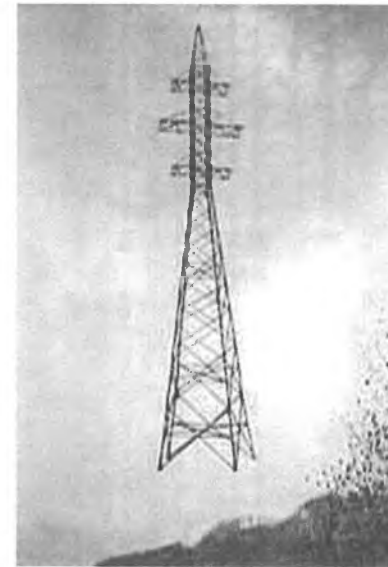


Oil and Gas E&P (and remote areas)

Mining



Power Grid/Cell Towers



# Alaskan North Slope Oil & Gas Potential Production & Today's Market Value

## ALASKA FACTS

- **First Major Oil Discovery:** 1957.
- **Industry Investment:** \$50B+ to date.<sup>1</sup>
- **State Production:** 16+ billion barrels of oil (bbo).<sup>1</sup>
- **North Slope Oil Fields:** 4 of 10 largest in US; 12+ currently producing.<sup>1</sup>
- **North Slope Estimates:** ultimate recoverable oil reserves of 22.2 bbo; up to 124 trillion cubic feet (tcf) of natural gas.<sup>1</sup>
- **Prudhoe Bay Field:** 1,000+ wells; largest oil field in North America & largest producing US oil field; site of large natural gas processing plant.<sup>2</sup>
- **Prudhoe Bay Estimate:** 2.5 billion barrels of recoverable oil & 426 million barrels in reserves.<sup>1</sup>
- **Pipeline Infrastructure:** 800-mile Trans-Alaska Pipeline System (TAPS); 1.5+ million barrels per day of spare capacity; supplying American energy to Americans without environmental risks or 'dirty oil' associated with Keystone Pipeline.
- **Ongoing Development:** major operators such as Exxon Mobil (NYSE:XOM | Market Cap: \$410.84B), BP (NYSE:BP | \$139.96B) and ConocoPhillips (NYSE:COP | \$71.86B) investing heavily in oil and gas-related projects.

1. Resource Development Council for Alaska (website), Oct. 18, 2012.

2. ConocoPhillips (website), Oct. 18, 2012.

**Today's Estimated North Slope Oil Reserves of up to 22.2 billion barrels of oil are valued at \$2.3 trillion at today's prices**

**Today's Estimated North Slope Natural Gas Reserves of 123 Trillion Cubic Feet (TCF) are valued at \$459 billion at today's prices**



# OIL AND GAS - 1



# OIL AND GAS - 2

## MACONDO INCIDENT

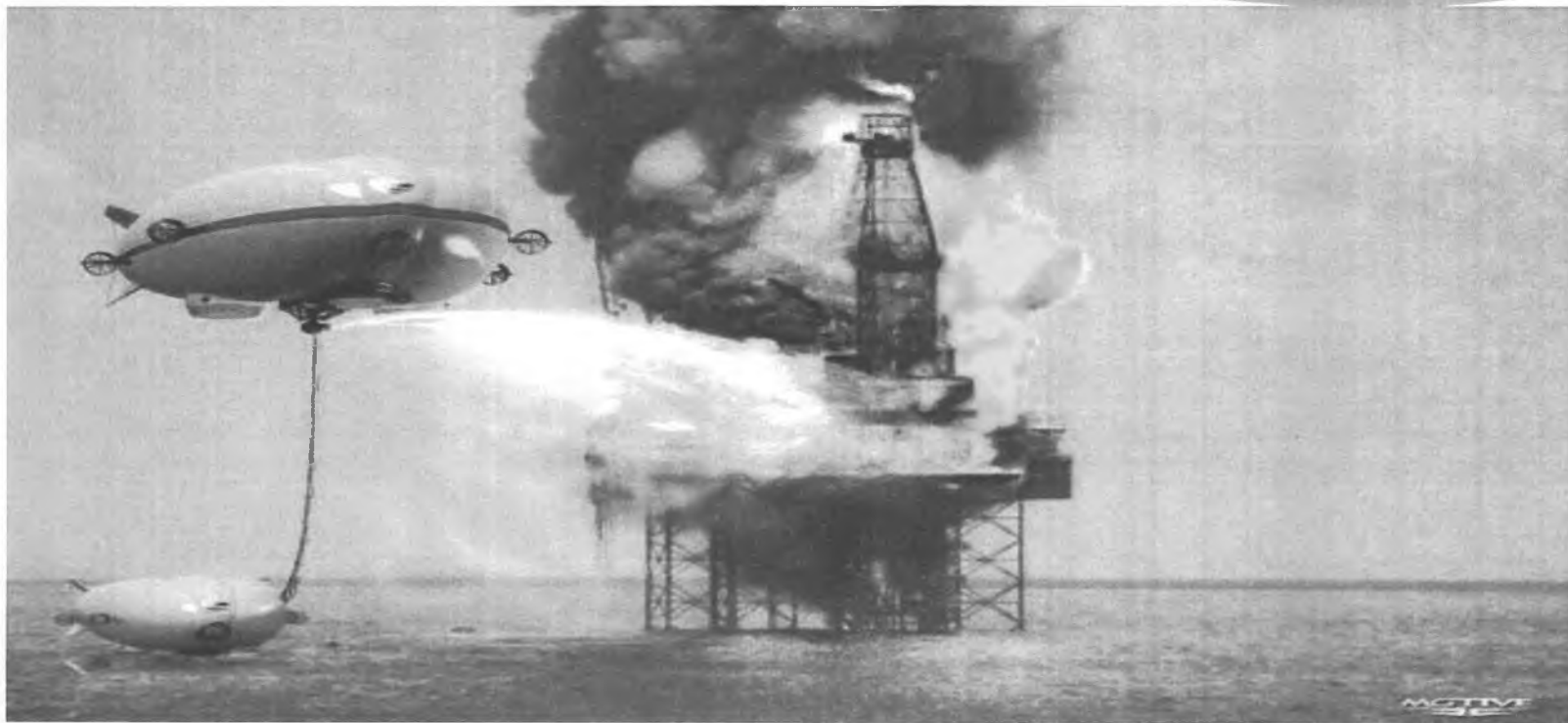
**It is critical to get a craft onsite as quickly as possible for command & control, well control, SAR, firefighting/suppression, oil spill containment & collection**

98% of water used  
in firefighting is  
wasted.  
Until Now!



# APPLICATIONS OIL & GAS RAPID EMERGENCY RESPONSE

**Emergency Response, Firefighting, Containment, Collection, Search & Rescue (Could have be on scene at Macondo Incident in 11/2 hours)**



# APPLICATIONS OIL & GAS RAPID EMERGENCY RESpense

Emergency Response, Firefighting, Containment,

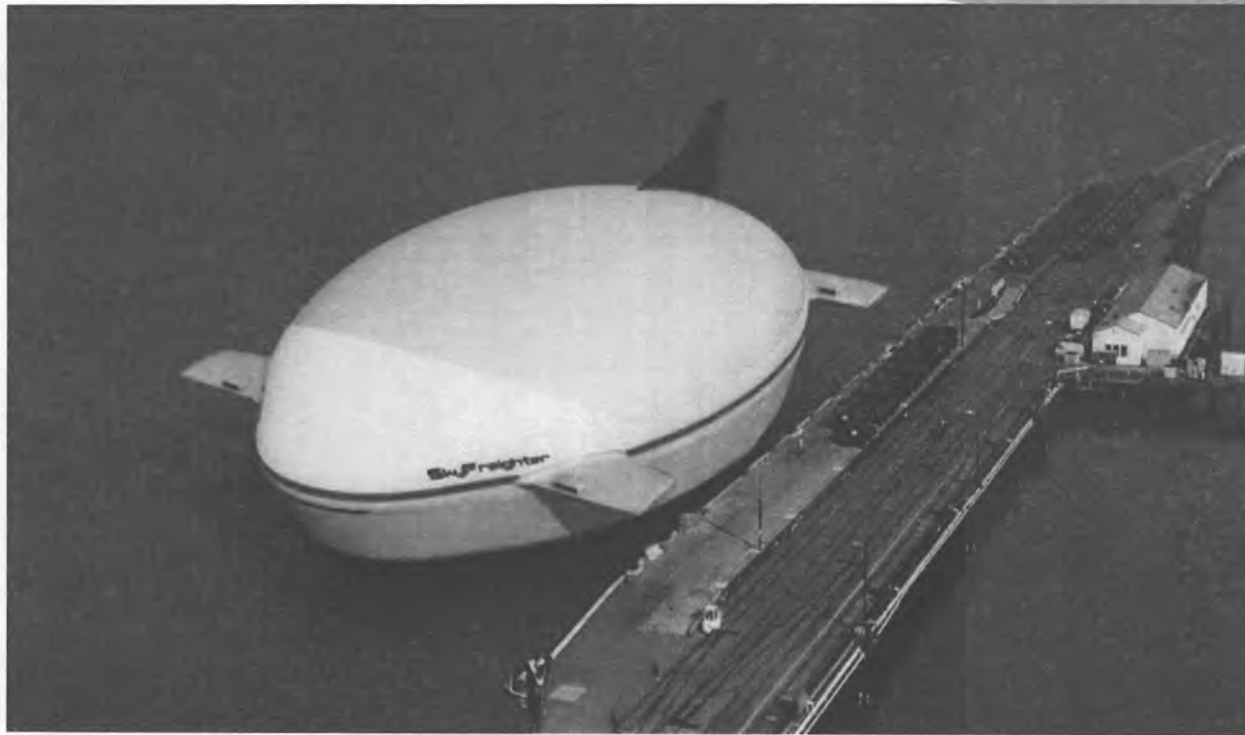


Innovative Nozzle  
Technology

New technology to lift & apply modified seawater



# LNG TRANSPORT



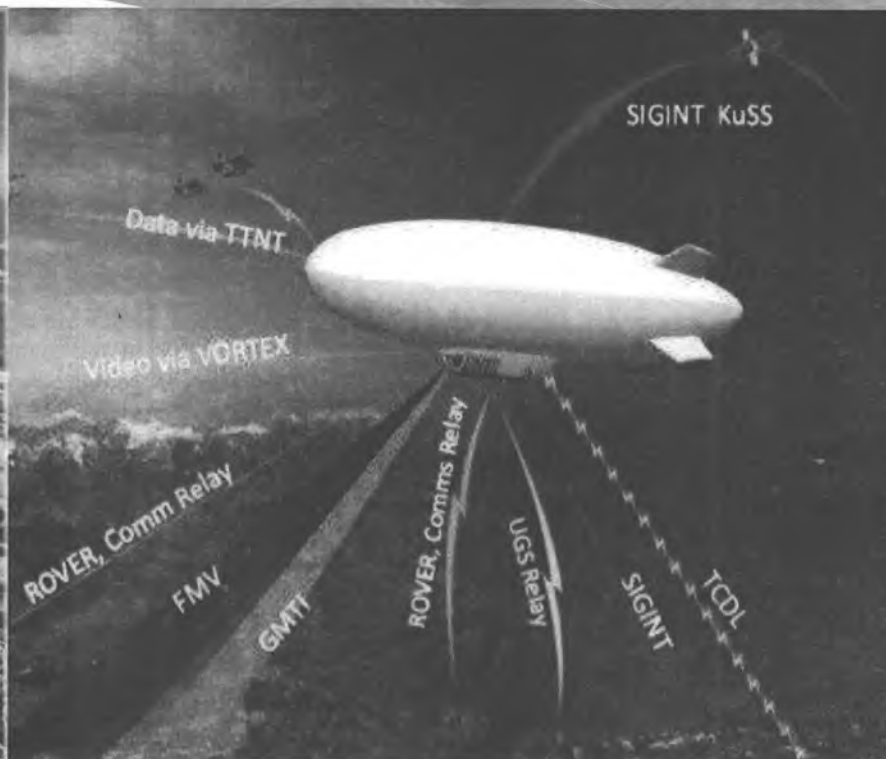
LNG GAS IS QUICKLY BECOMING A HIGHLY NEEDED COMMODITY BUT BEING ABLE TO DELIVER IT QUICKLY AND BE COST EFFECTIVE HAS BEEN AN ISSUE. ITS NOW POSSIBLE WITH THE SKYLIFT TANKER TO LOAD FROM ANY LOCATION AND DELIVER EASILY TO ALMOST ANYWHERE, MAKING THE USE OF LNG MORE PRACTICLE AND ECONOMICAL.



# ALTERNATE TRANSPORT



# SURVEILLANCE AND MAPPING



courtesy: U.S. Air Force



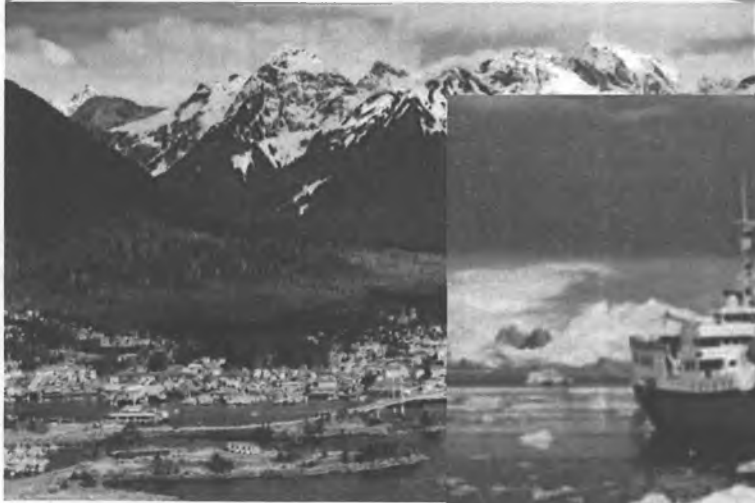
# ON THE SPOT MEDICAL RESPONSE

100 TON VARIANT

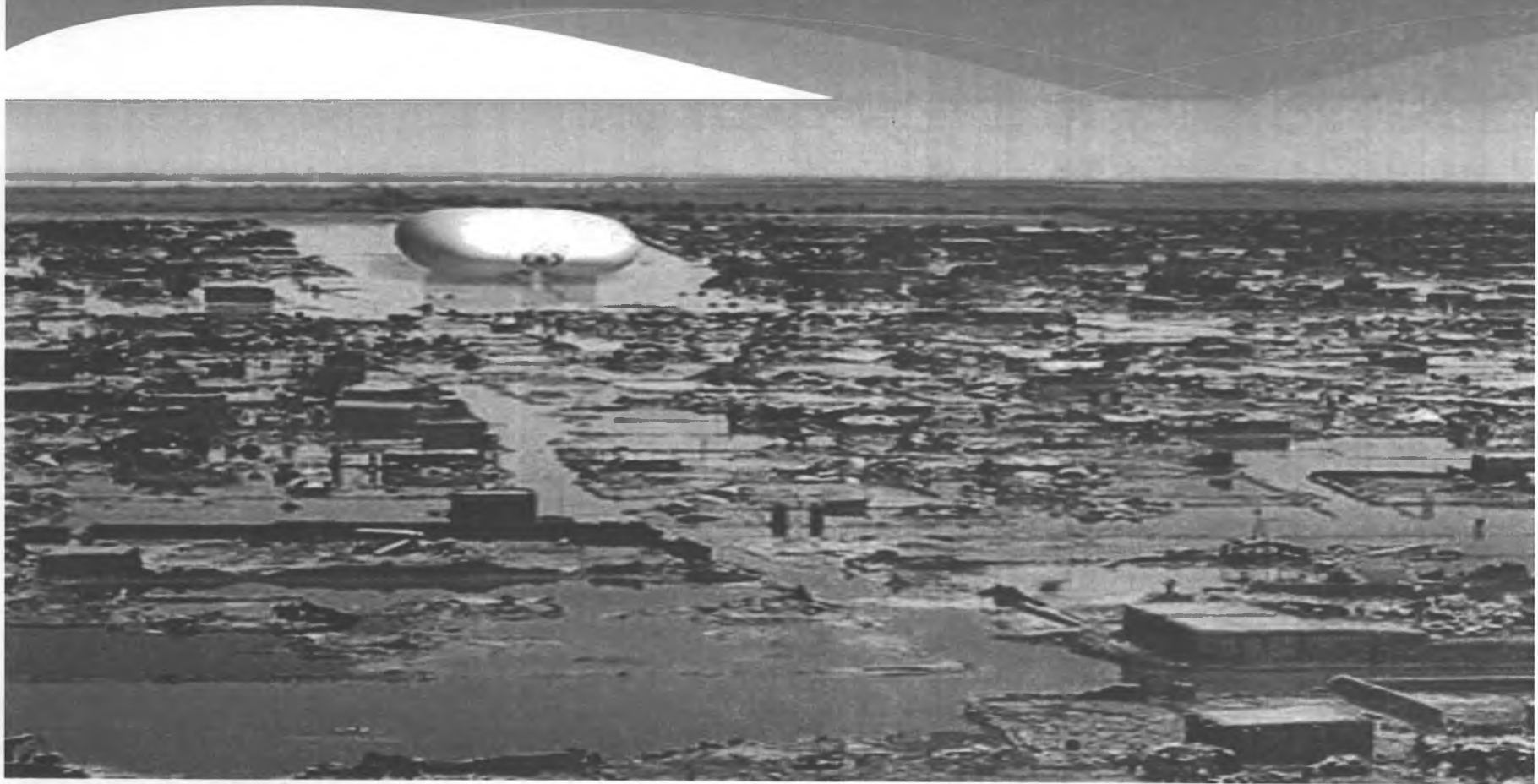
WHEN TIME IS NOT AN OPTION



# TOURISM



# DISASTER RELIEF



# DISASTER RELIEF

## Hurricane Katrina

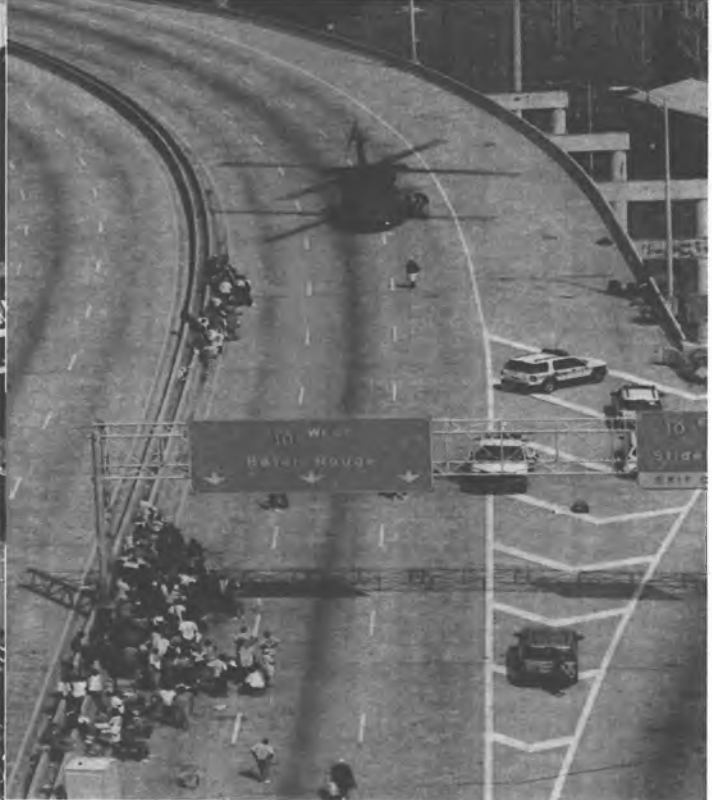


- 1,836 people died in the hurricane and
- An estimated \$90 billion worth of damage.



# DISASTER RELIEF

Hurricane Katrina – A few people at a time by helicopter



# SEARCH AND RESCUE



# FISHING ENHANCEMENT



# FIRE FIGHTING

## Wildfire Air Tanker Concept

An average of 50 Tankers are needed, but only 7 are operating\*  
Wildfire fighting experts agree 50 additional planes are needed  
to complement ground crews overwhelmed by the number and  
intensity of wildfires during the fire season.

The Cost of putting out wildfires is over \$1.65 billion/year.

\*July 3, 2012 Disaster Relief & Reuters, 2012



# HYBRID AIRCRAFT WILDFIRE AIR TANKER CONCEPT



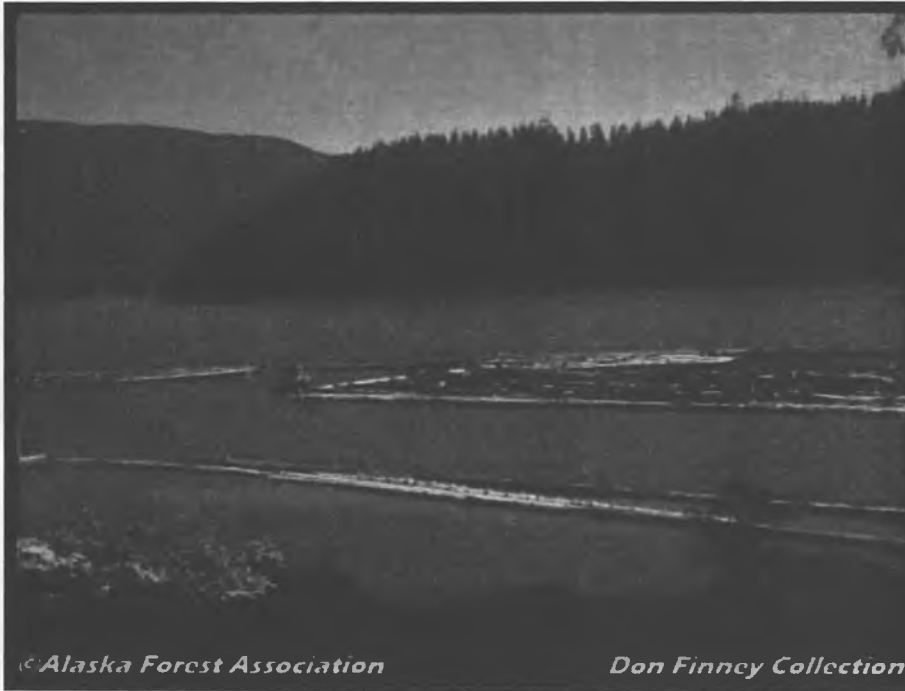
NOT JUST A TANKER! A New Disruptive Firefighting System



# FOREST MANAGEMENT



# TIMBER AND LOGGING



©Alaska Forest Association

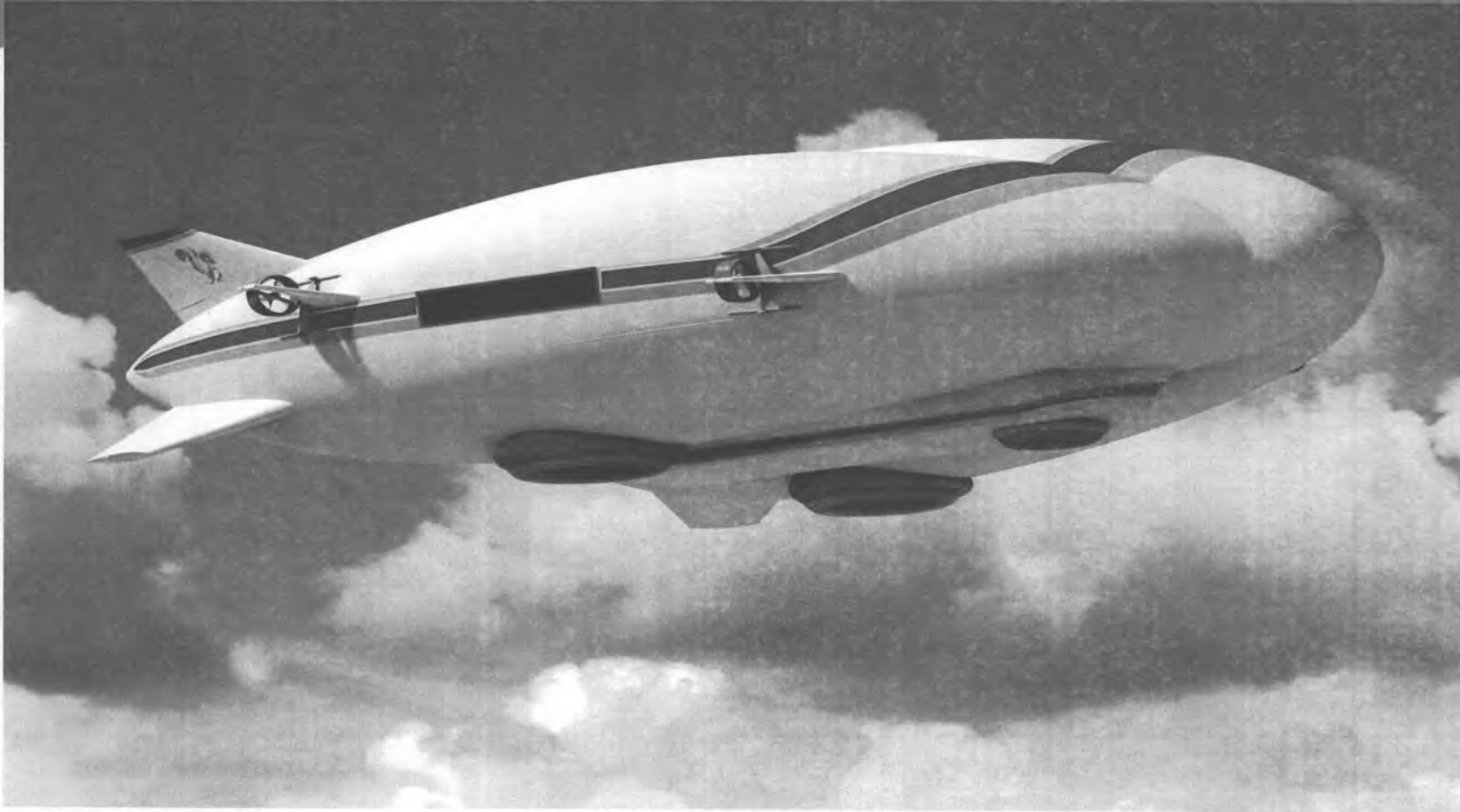


Don Finney Collection ©Alaska Forest Association

Don Finney Collection



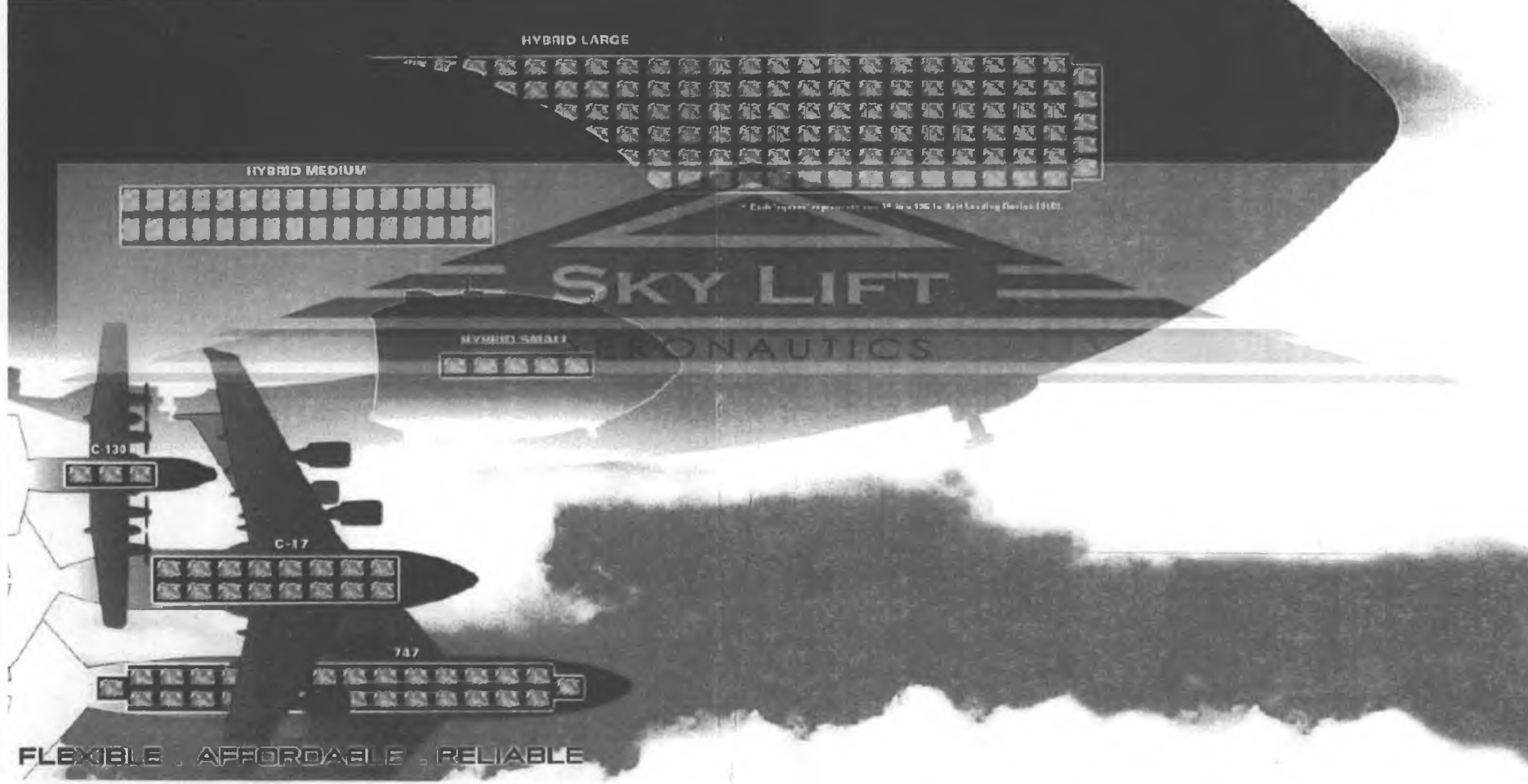
# SKYLIFT HYBRID AIRCRAFT



CARGO BAY COMPARISONS



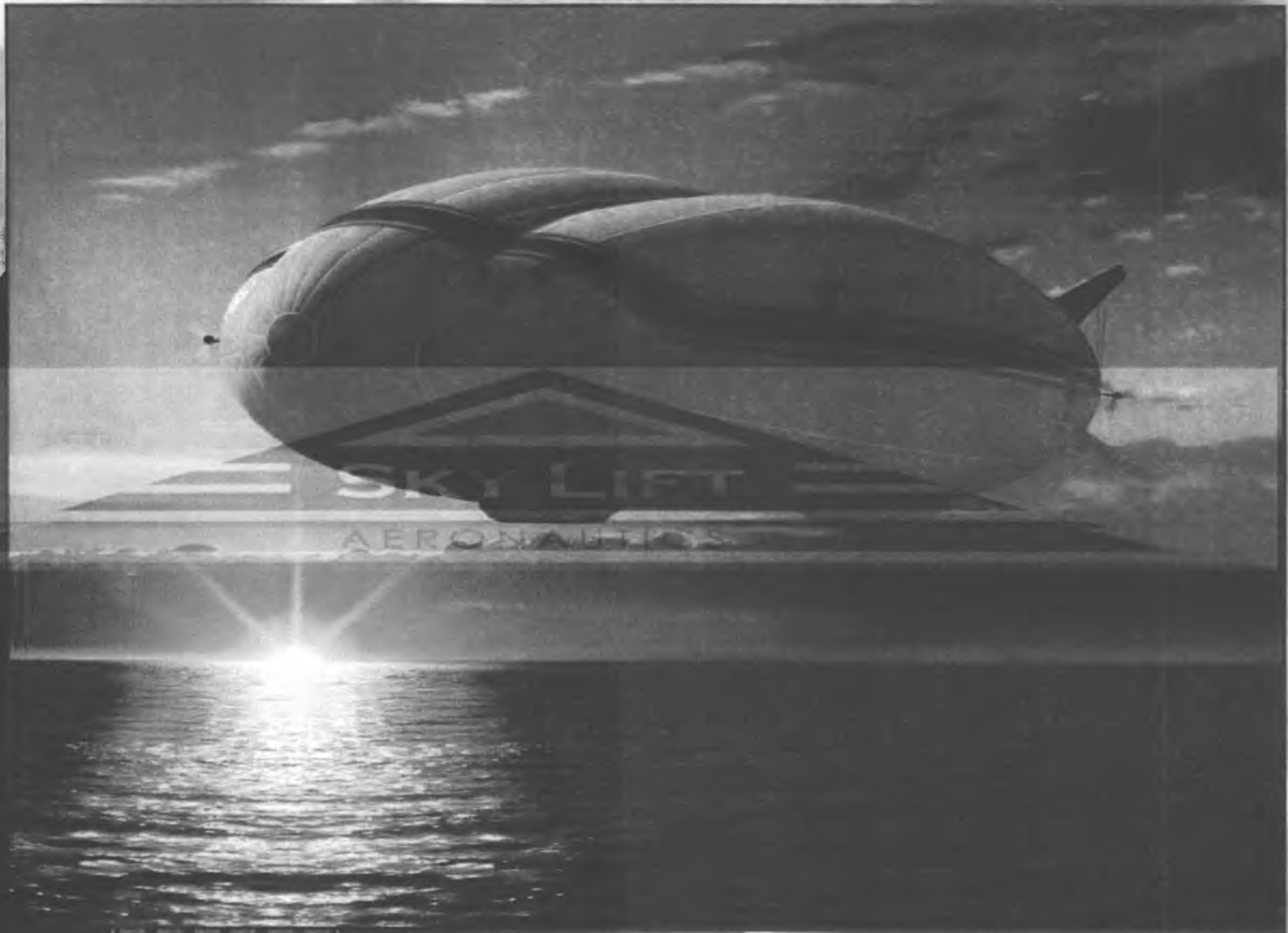
# HYBRID MATTERS



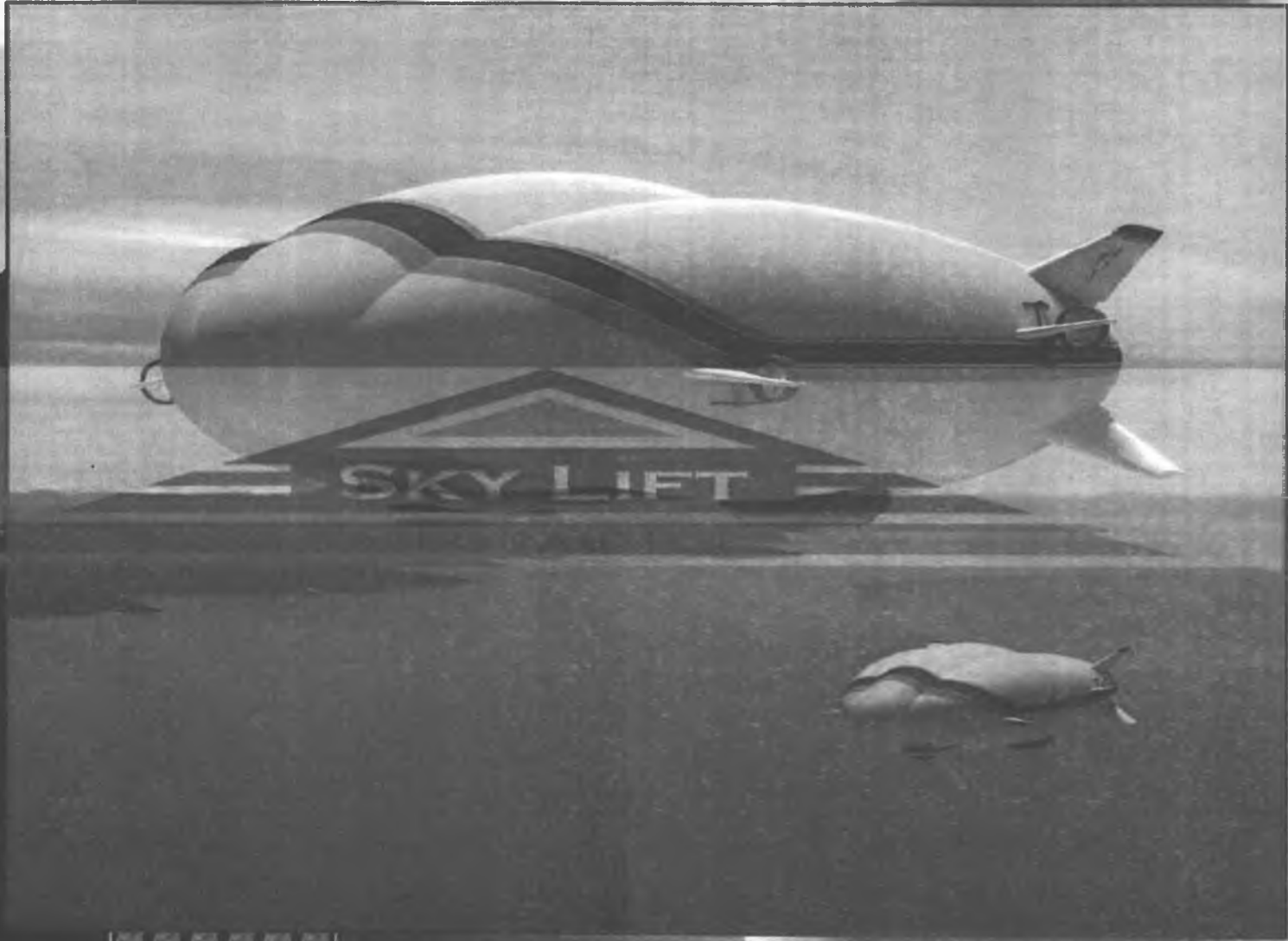
FLEXIBLE . AFFORDABLE . RELIABLE



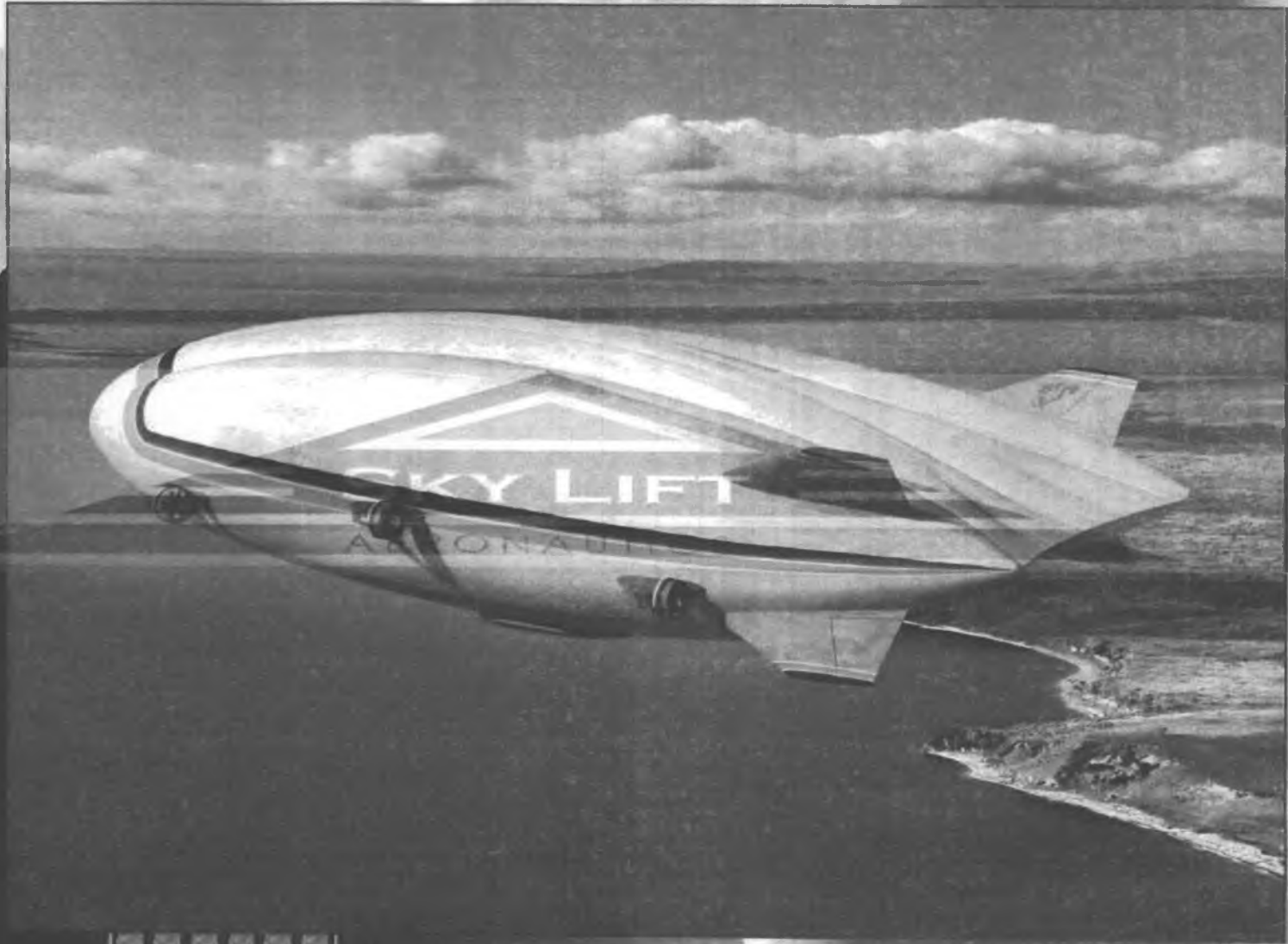
HYBRID SMALL



# HYBRID MEDIUM



HYBRID LARGE



# 4 Proven Technologies Merged Into 1 Transformational Technology



**Helicopter**

Vertical  
Airlift



**Cargo Airplane**

Deltoid Shape  
Aerodynamic Lift

**Hybrid Aircraft**



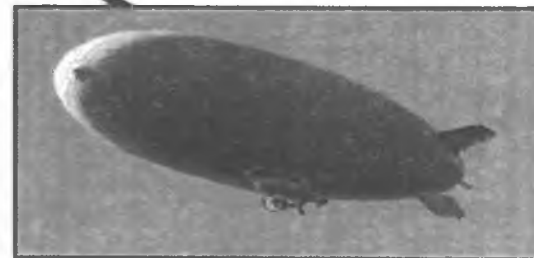
Vectored  
Thrust



**Hover Craft**

Air  
Cushion  
Landing  
System  
(ACLS)

Helium  
Filled  
Envelope  
Up to 80%  
Vertical lift



**Airship (Blimp)**



# FOR MORE INFORMATION

## ON HOW TO ORDER THE AIRCRAFT AND OR SPECIFICATIONS

### HYBRID VARIANTS

20 TON CAPACITY  
100 TON CAPACITY  
500 TON CAPACITY

### CONTACT:

R. MICHAEL SMITH  
[Michael.smith@skyliftaero.com](mailto:Michael.smith@skyliftaero.com)  
1-714-262-6839

Kurtis Zell  
[Kurtis.zell@skyliftaero.com](mailto:Kurtis.zell@skyliftaero.com)  
1 702 232 9029

