



Small Scale Project Success – Low Temperature Power Generation



UTC Power

A United Technologies Company

United Technologies Corporation



Shifting the Paradigm

A US\$47B Company (2006)



Carrier



Otis



UTC Fire & Security



Pratt & Whitney



United Technologies



Sikorsky



Hamilton Sundstrand



Research Center



UTC Power



UTC Power

A United Technologies Company

**Global
Sales**



**5 continents
19 countries**

United Technologies Corporation

Shifting the Paradigm

Within UTC, a *unique synergy* was achieved...



UTC Research Center
– Technology
Advancement



Carrier
– Heating, Cooling
& Refrigeration



UTC Power
– OnSite Solutions

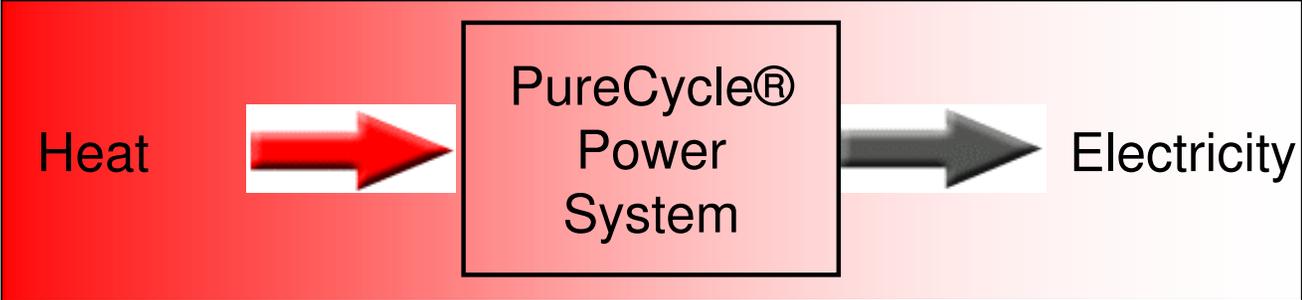
leading to the development and introduction of
a New CHP Technology Solution...



PureCycle[®] “reverses” air conditioning cycle



~~Combustion~~ ~~Emissions~~ ~~Fuel Cost~~



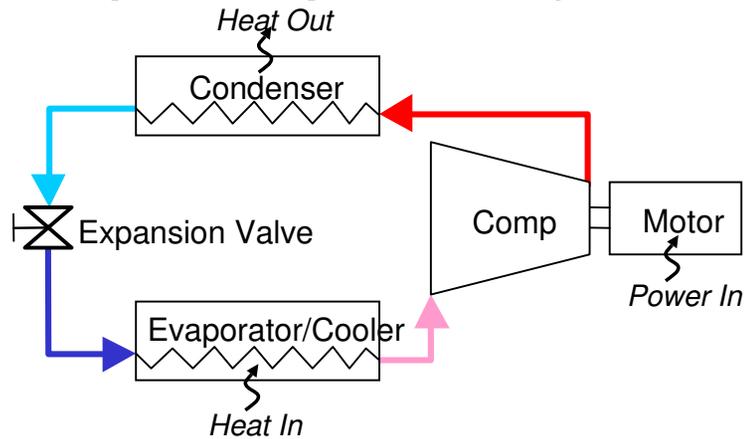


HVAC Component Synergy

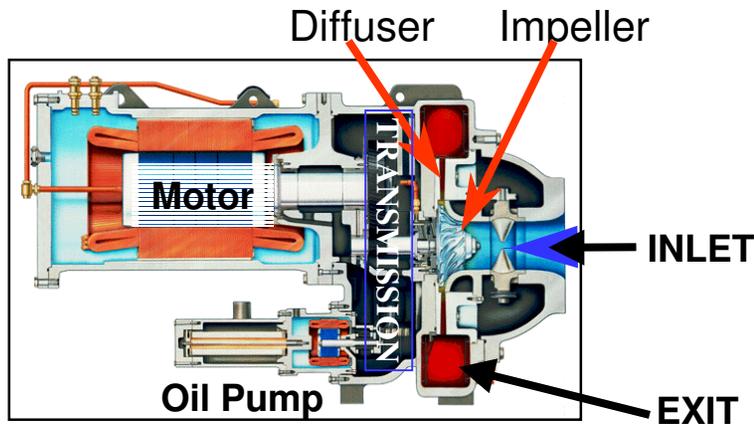
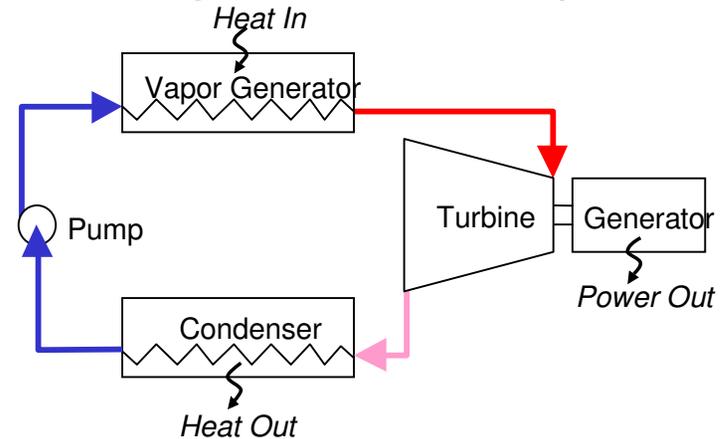
Shifting the Paradigm

Turbine Generator – Carrier 19XR2™

Vapor Compression Cycle (VCC)

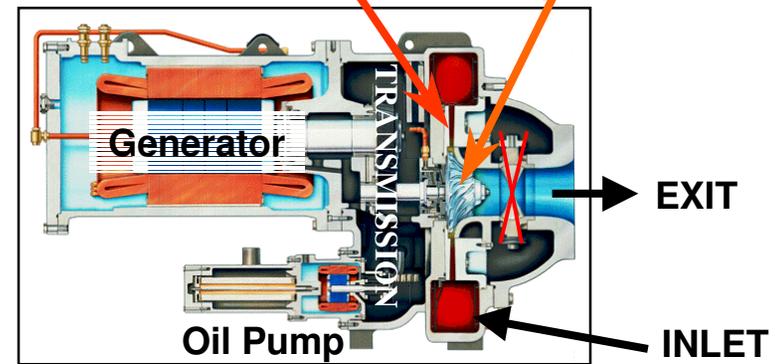


Organic Rankine Cycle (ORC)



19 XR225 Centrifugal Compressor

Required Modifications Nozzle Impeller



19 XR225 Radial Expansion Turbine

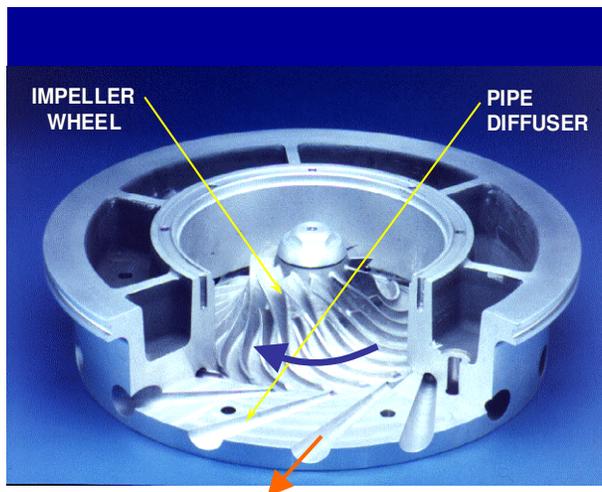


Modular Carrier Components

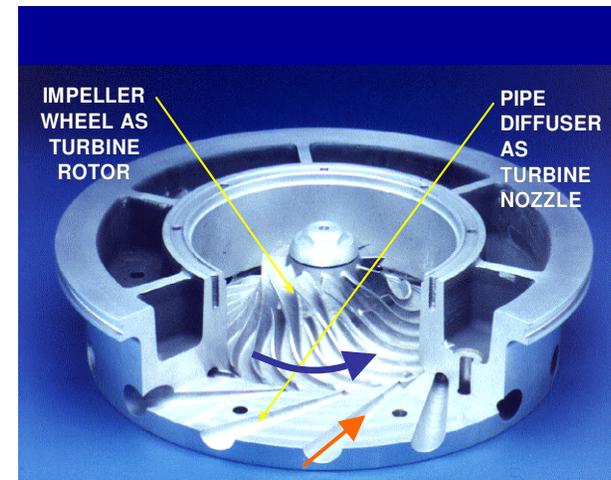
Shifting the Paradigm

Turbine Generator – Carrier 19XR2™

Adaptation of Existing Hardware - Compressor vs. Turbine Operation



Centrifugal Compressor Operation:
Cut-away Of Compressor Impeller
(Spinning Clockwise)
and Diffuser
(Radial Out-Flow Compressor)



Radial Expansion Turbine Operation:
Cut-away Of Turbine Rotor
(Spinning Counter-clockwise)
and Nozzle Block
(Radial In-Flow Turbine)

Impeller, nozzle and shroud – only conversion required

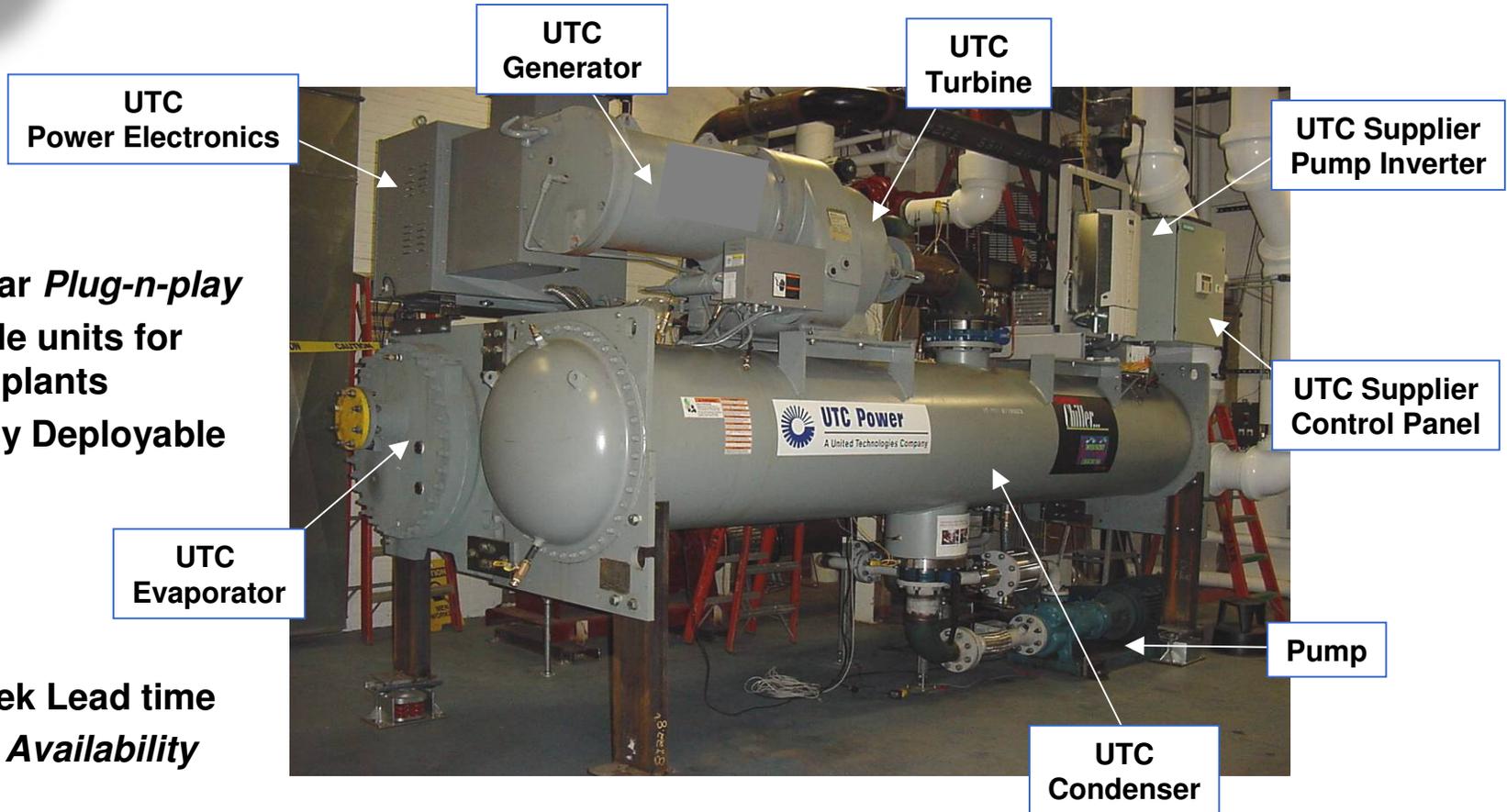


Modular Geothermal Power Plant

Shifting the Paradigm

- **Modular *Plug-n-play***
- **Multiple units for larger plants**
- **Rapidly Deployable**

- **16 Week Lead time**
- **≥95% Availability**



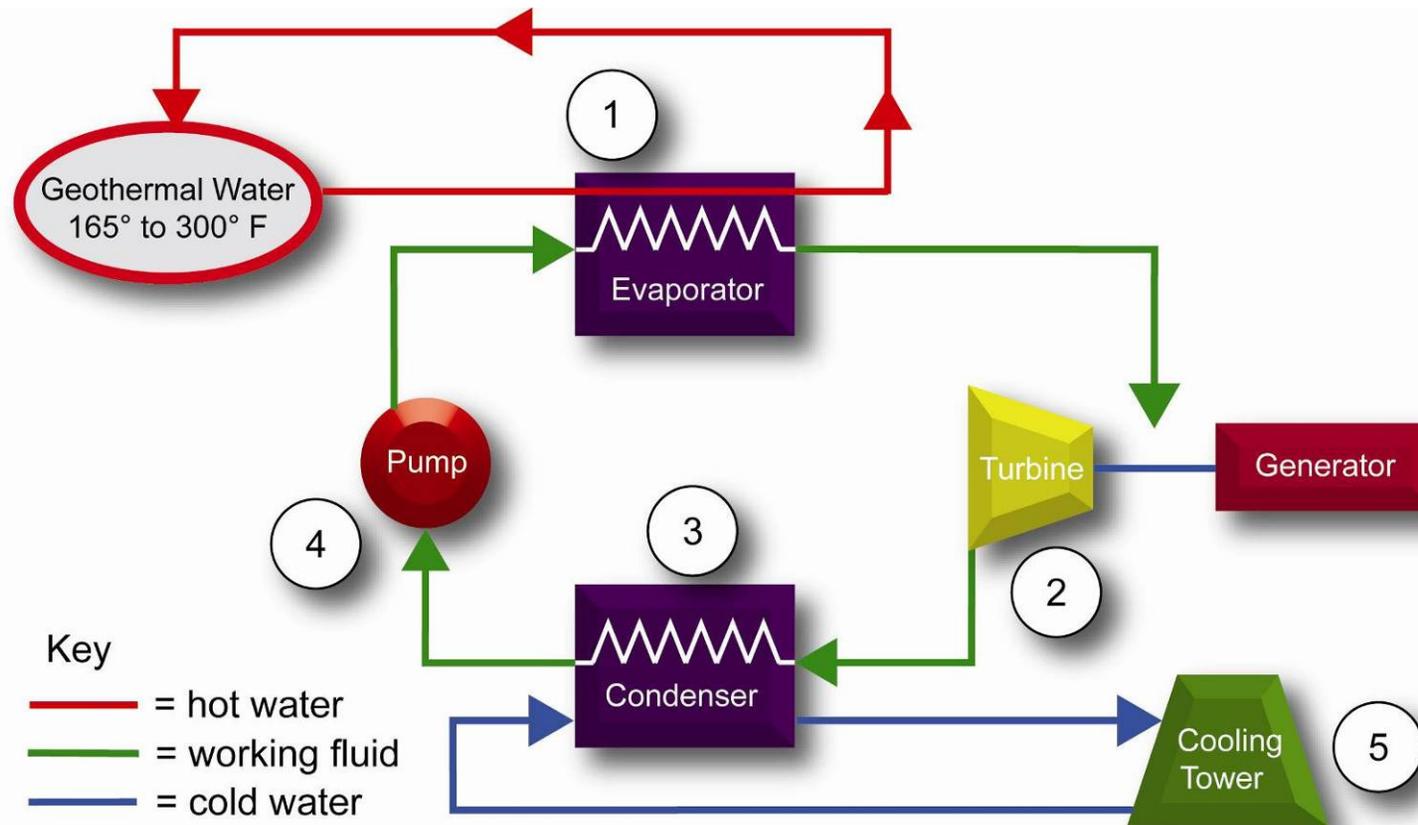
PureCycle® 225 KW Geothermal power plant



*** 90% UTC high volume off the shelf components**

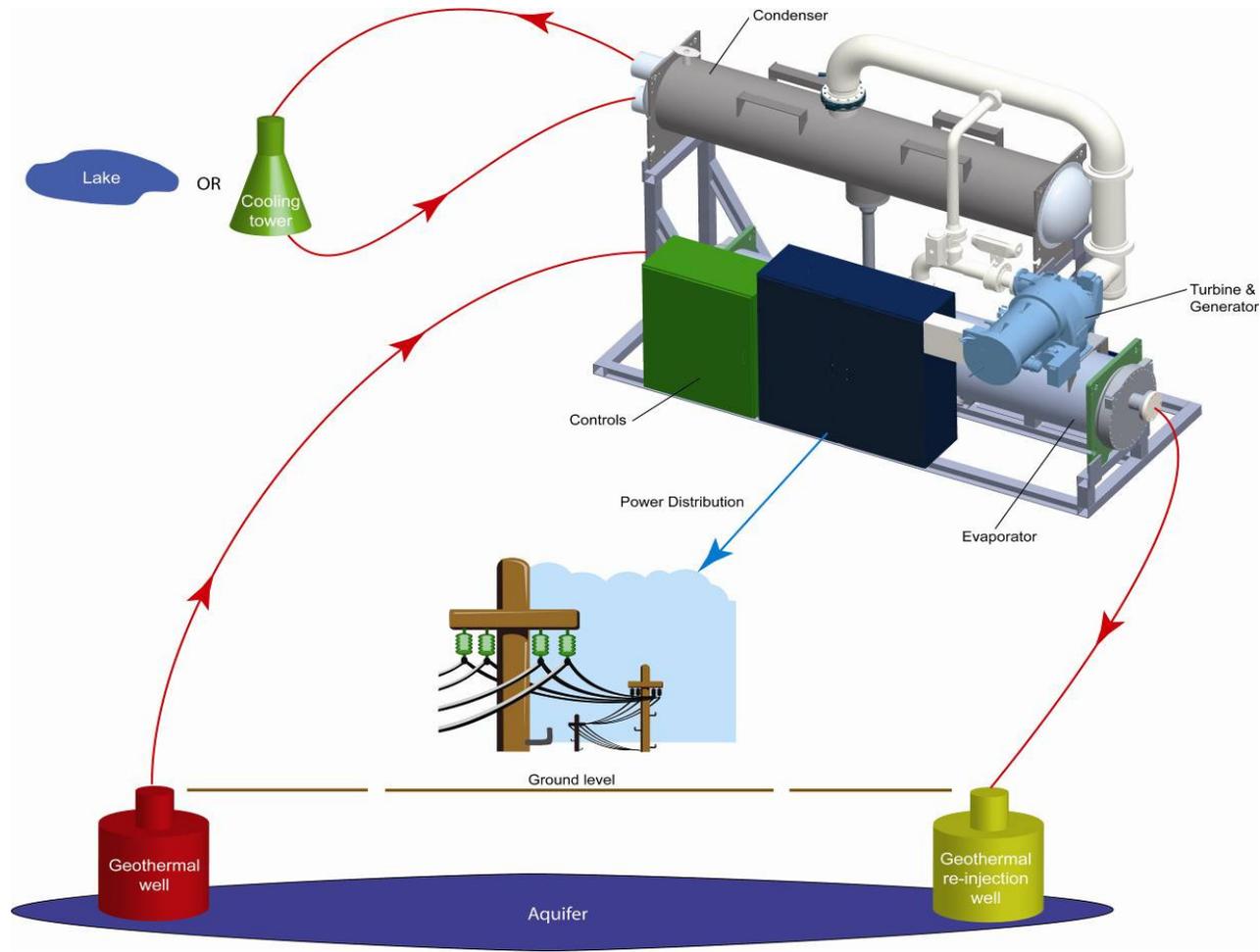


PureCycle[®] Geothermal Power Plant



PureCycle[®] Geothermal System

Shifting the Paradigm





Equivalent emissions reduction

Shifting the Paradigm

Avoided emissions for a 1.0 MW system

	Annual Avoided CO ₂ Emissions		Annual Avoided NO _x Emissions	
	Tons	Equivalent acres of forest*	Tons	Equivalent number of cars**
PureCycle® 225's <i>(95% capacity factor)</i>	6,045	1,270	10.80	570
Wind (25 - 40% capacity factor)	1,585	335	2.86	150
Solar (14 - 32% capacity factor)	885	185	1.60	85

* Each acre of forest assumed to absorb 1.3 tons Carbon/acre/year (Ref: International Panel on Climate Change)

** Each car assumed to generate 38 lbm/NO_x/year (Ref: US EPA)

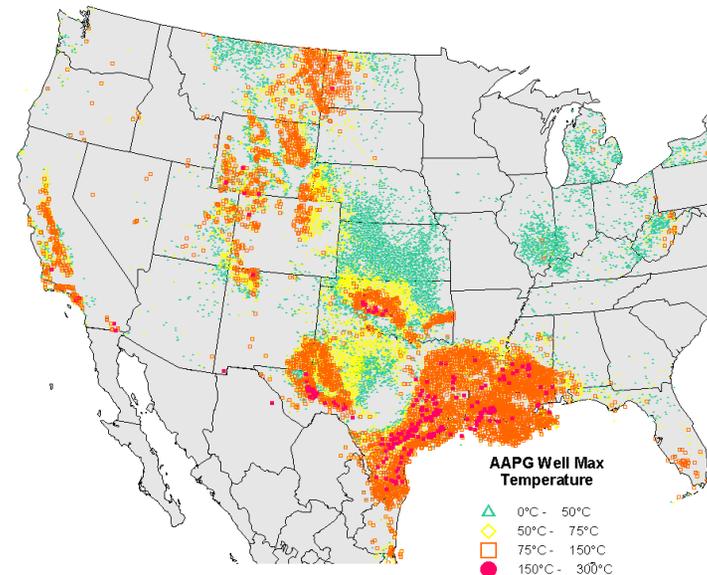
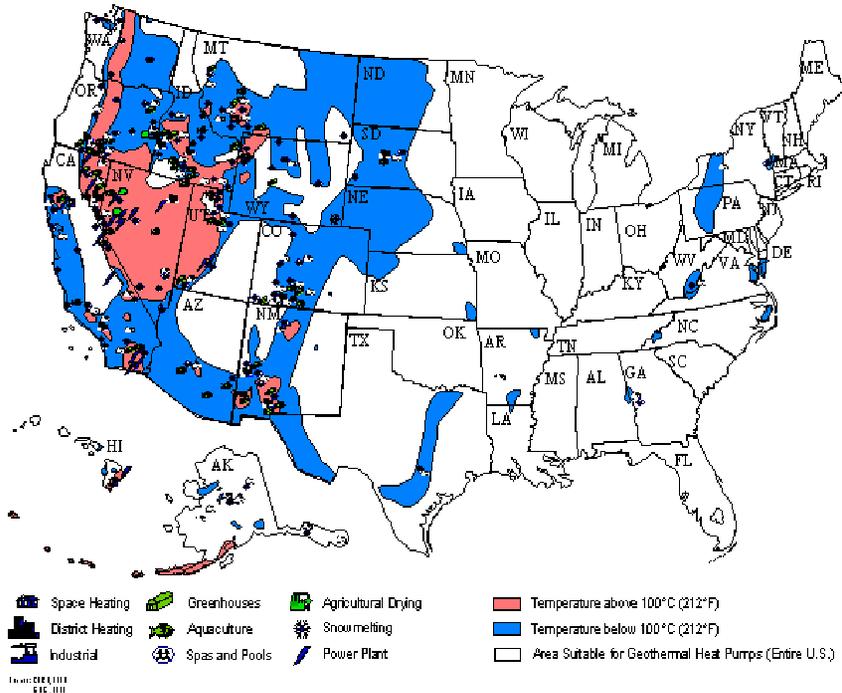


PureCycle® Potential Markets

Shifting the Paradigm

UTC Power is experiencing market traction in geothermal arena

U.S. GEOTHERMAL PROJECTS AND RESOURCE AREAS



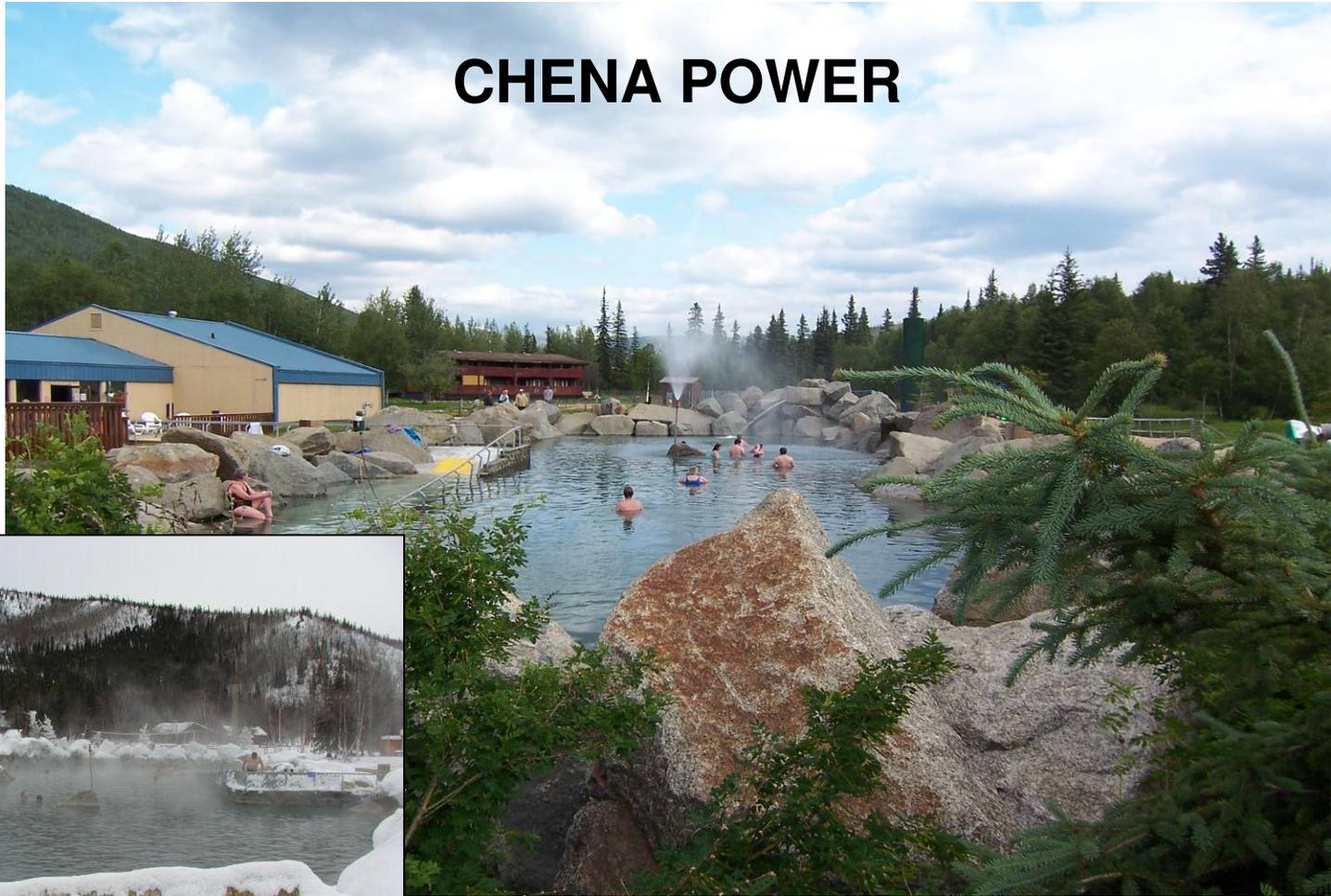
Oil & Gas markets extends geothermal potential

Chena Geothermal Demonstration



Shifting the Paradigm

CHENA POWER





Geothermal Demonstration

Shifting the Paradigm

Chena Hot Springs - AK

- **Commissioned July, 2006 – 1st unit**
- **2nd unit in November 06**
- **<165°F geothermal temp**
- **99.4% Availability**



Hot Water – Cold Water

Shifting the Paradigm



- 8" HDPE ~ 3000 ft from well # 7
 - Well depth ~ 700 ft.
 - Production pump ~200 ft.
- 8" return to re-injection well.
- Pipe is insulated and buried.
- Producing ~ 500 gpm for unit # 1.
- Pump parasitics ~ 35 kW.

- 16" pipe - 3000 ft.
- Cooling from Monument Creek.
- Galley ~ 33 Feet above power plant
- Gravity feed \leq 1700 gpm
 - No pump - no parasitic.
- Return via culvert ~ 8° F rise
- Condenser EWT ~ 33° F - 52° F.



Chena Hot Springs Performance

Shifting the Paradigm

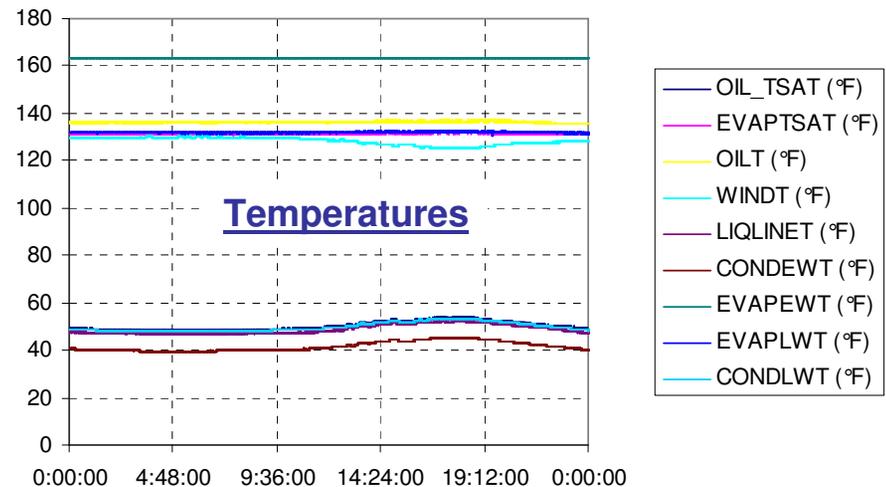
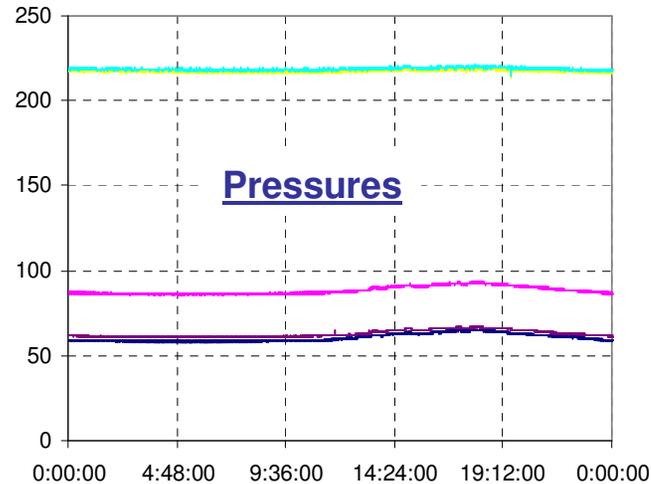
Extremely stable operation:

- Cold temp affects gross power.
- Hot temp doesn't vary.
- **99.4% availability**

Averaged values — 8/23/07

CondEWT (F)	41.64
CondLWT (F)	49.88
EvapEWT (F)	162.97
EvapLWT (F)	131.88
EvapP (psia)	217.45
CondP (psia)	62.80
PumpKW (kW)	20.36
GenKW (kW)	196.09
RefFlow (#/s)	23.22
TsatEvap (F)	131.40
TsatCond (F)	52.30
EvapGPM (gpm)	488.55
CondGPM (gpm)	1666.98

8/23/07





Top Level Assembly

Shifting the Paradigm

**ESTIMATED DRY
WEIGHT = 10,000 kg
(22,000 LBS)**

ELECTRONICS

TURBINE

EVAPORATOR

CONDENSER

**2.1m
(7'- 5")**

**5.1m
(16'- 10")**

**3.2m MAX
(10'- 4")**



UTC Power

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Raser Technologies

Shifting the Paradigm

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RASER TECHNOLOGIES AND UTC POWER TO WORK TOGETHER TO TAP GEOTHERMAL RESOURCES

Up To 135 PureCycle® Power Systems to Supply 30MW of Renewable Power

SOUTH WINDSOR, Conn., PROVO, Utah, April 12, 2007 – UTC Power, a United Technologies Corp. (NYSE: UTX) company, and Raser Technologies of Provo, Utah (NYSE Arca: RZ), today announced they have entered into a series of agreements for UTC Power to provide up to 135 PureCycle® geothermal power systems for three Raser power plants. In total, these systems will generate approximately 30 megawatts (MW) of renewable electrical power.

The agreements contemplate a long-term relationship in tapping geothermal resources to provide renewable power and in continuing to improve organic Rankine cycle power generation technology. They also allow for testing with respect to the possible adoption of motor technologies owned and licensed by Raser. The agreements further provide for certain down payments by Raser to UTC Power, and the financial terms reflect consideration for the technology development and field demonstration anticipated by Raser and UTC Power. Other financial terms of the transaction were not disclosed.

Delivery of the first 45 units begins in the fourth quarter of 2007 to the first of Raser's three initial geothermal sites. UTC Power has also signed a service agreement with Raser for maintenance of these units.

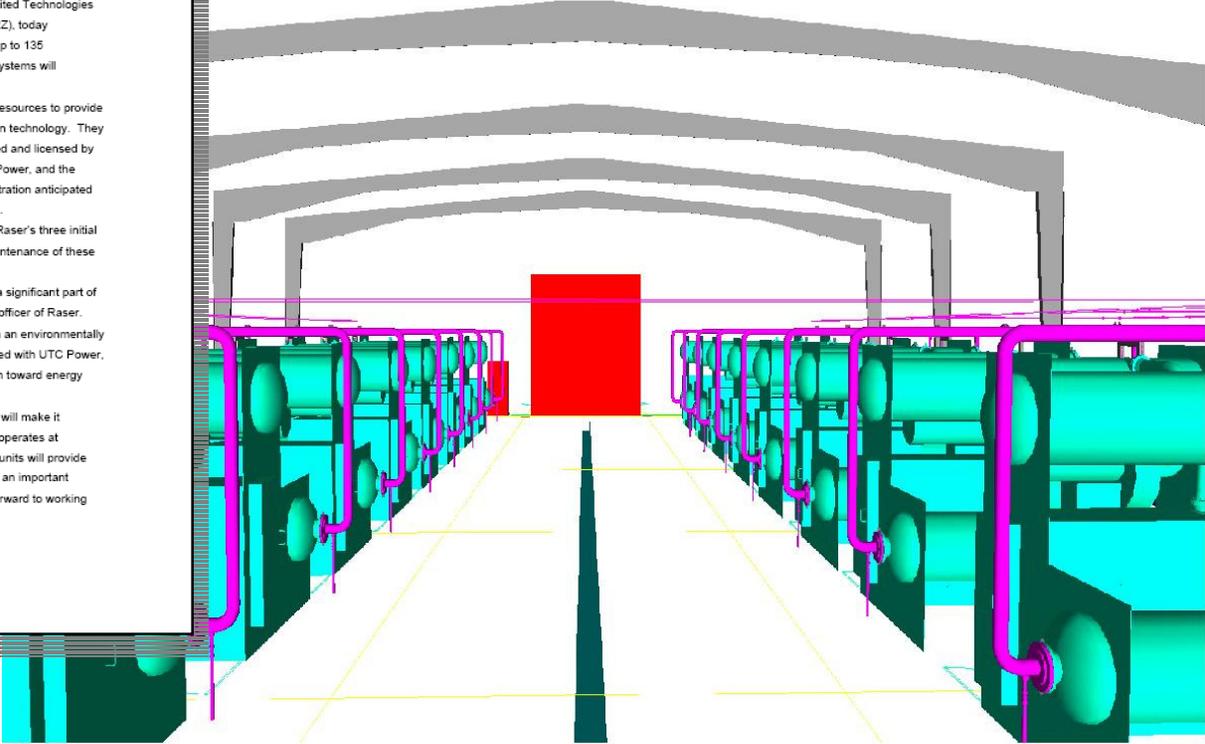
"We believe these types of renewable energy-producing power plants will be a significant part of the U.S. power production portfolio in the future," said Brent M. Cook, chief executive officer of Raser.

"Accelerated development of domestic geothermal resources will produce electricity in an environmentally friendly way and contribute to energy independence. We are delighted to be associated with UTC Power, whose entry into geothermal power generation is a significant step in our nation's push toward energy independence."

According to UTC Power President Jan van Dokkum, "The PureCycle system will make it possible to tap into a significant new domestic renewable energy resource because it operates at previously unusable low temperatures -- from 165 to 300 degrees Fahrenheit. These units will provide renewable power around the clock from a 'free' fuel source. The PureCycle system is an important addition to UTC Power's environmentally responsible product offerings and we look forward to working with Raser in aggressively deploying and advancing this technology."

(3) 10.0 MW – (135) 225 KW units

4/12/07





Raser Technologies

Shifting the Paradigm

10 MW – on up ↗

- Modular *Plug-n-play*
- Multiple units for larger plants
- Rapidly Deployable
- 16 Week Lead time
- High Availability
- Expand w/ resource

- “Speed – to – Market”





Lightning Dock, Animas, NM - Raser Technologies

Shifting the Paradigm



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FOR IMMEDIATE RELEASE

RASER TO ACQUIRE GEOELECTRIC POWER COMPANY NM, LLC

Lightning Dock Project Has 20 Megawatt Generating Potential

Acquisition Shortens Power Plant Development Timeline

PROVO, UT, October 1, 2007 – Raser Technologies, Inc. (NYSE Arca: RZ) announced today that it has reached an agreement to acquire GeoElectric Power Company NM, LLC. GeoElectric NM is a single purpose company, owning the geothermal rights to the known and well studied Lightning Dock geothermal resource in southwestern New Mexico. Studies predict that this resource has the potential to produce in excess of 20 megawatts of clean, renewable electric power, enough to power approximately 20,000 homes.

The Lightning Dock resource is one of the nation's first Bureau of Land Management leaseholds held by geothermal production and has an existing direct-use production history of over 20 years at temperatures and flow rates believed to be well suited for power generation with Raser's UTC Power PureCycle® equipment. The site has an existing 7,000 foot well that exhibits temperatures in excess of 300 degrees F with substantial flows at depths of 1,500 to 2,500 feet. In addition to the primary well, over 40 observation, flow test and gradient wells have been drilled on the site and have confirmed the existence of a wide-spread geothermal resource at a depth of less than 2,500 feet. Substantial DOE-funded geological, geophysical, and geochemical studies have been conducted on the Lightning Dock site; including reports by Sandia National Laboratories and other industry experts.

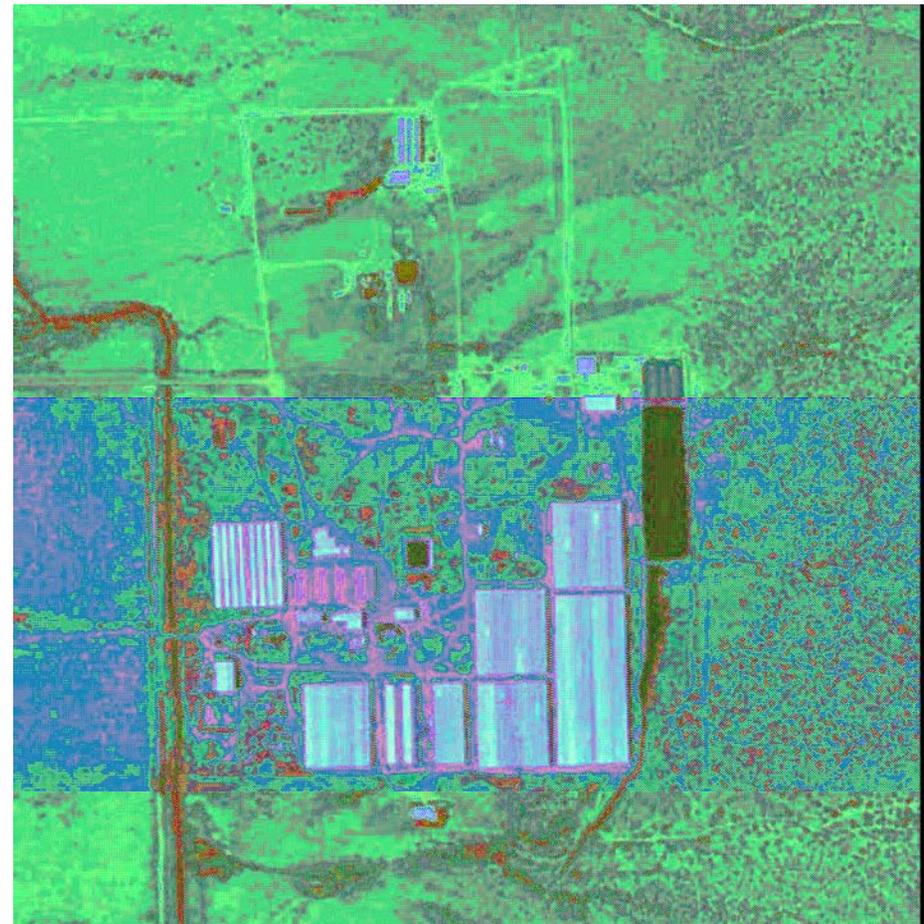
Under the terms of the acquisition, Raser will pay to the owners of GeoElectric NM a fixed amount up front, with the balance of the consideration due upon the earlier of specified dates or the attainment of certain development milestones, including successful flow-testing of production wells, execution of a definitive power purchase agreement, and placing the facility in service.

"This transaction is an exciting move for Raser," said Brent Cook, Raser's CEO. "By acquiring the existing geothermal production capabilities of GeoElectric NM, we can substantially shorten our power plant development timelines. Also, acquiring resources that are at more advanced stages in the development spectrum diversifies our portfolio risks and will help us achieve our stated development goals. The acquisition also diversifies our resource base into New Mexico, a new state for Raser, and gives us entry into new power markets and other geothermal-friendly political environments."

- more -

15.0 MW Cascaded Power Plant

10/01/07



UTC Power

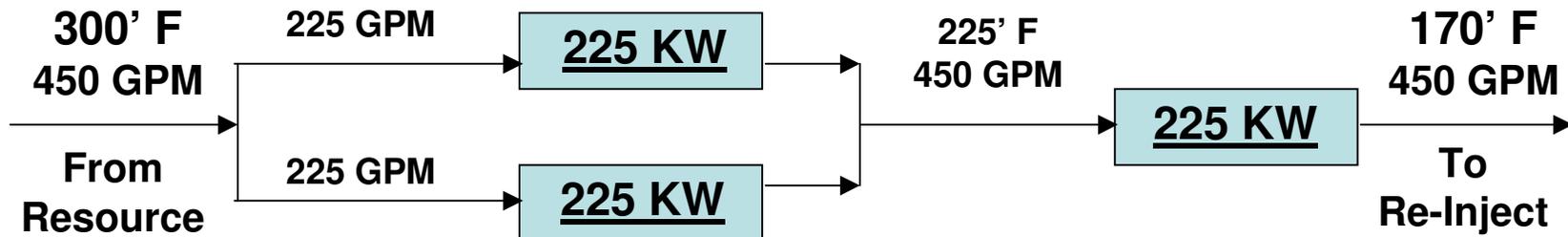
A United Technologies Company



Bottom Cycle - Cascading

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Typical* Estimated Performance PureCycle® “2-on-1” Series Cascade



300' F – 170' F @ 450 GPM Net ~ 675 KW output

(Typical Average of ~ 1.5 KW / GPM hot resource)*



PureCycle® Value Proposition Summary

Shifting the Paradigm

- **Current Geothermal Market**
 - Off-the-shelf production...
 - Low to moderate temps...
 - Bottom existing plants...
 - Low cost modular skid...
 - Rapid deployment...
 - Full remote control...
 - Full service contracts...
 - Multi-unit plant...
 - *Deploy based on resource...*
 - *Extreme statistical availability...*
- **Future for PureCycle® ~ Nominal 1.0 MW class unit**
 - *Target Production...*
 - Continue ramp 225 KW...
 - Oil & Gas proof...
 - *UTC Long term capabilities...*



Shifting the Paradigm



Thank you.

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Solving Tomorrow's Challenges with Today's Technology



UTC Power

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