

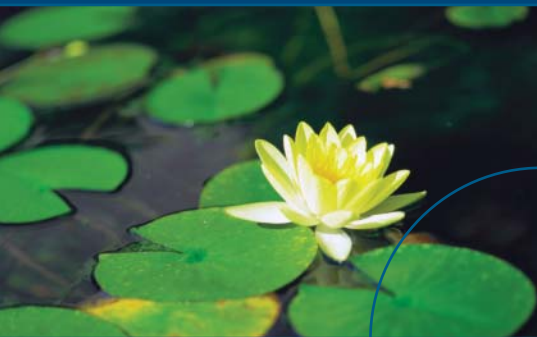
# PureComfort™ Cooling, Heating & Power Solutions

Energy Savings



Power Reliability

Environmental Stewardship



RETAIL

HEALTHCARE

HOTELS

OFFICES

PUBLIC BUILDINGS



**UTC Power**

A United Technologies Company

## Year-round Savings and Benefits, the Clean, Reliable Way.

### PureComfort™ Cooling, Heating, and Power Solutions.

Now you can have clean, cost-saving power and comfort from a single reliable source. The PureComfort™ cooling, heating, and power solutions make it possible. Instead of just converting fuel to electricity as power plants do, PureComfort™ solutions convert fuel to electricity plus hot and cold water, for a total building power and comfort generation system. As a result, overall building electrical consumption from the grid can be significantly reduced throughout the year.

#### Proven design and performance

The PureComfort™ solutions consist of a double-effect absorption chiller from our sister company Carrier, the world leader in building heating, cooling, and control networks, driven by exhaust heat from UTC Power 60 kW microturbines. With the double-effect absorption chiller, cooling and heating are achieved by the same unit, thus conserving space and simplifying design.

#### You and the environment both profit

The chiller cycle achieves cooling without using ozone-depleting fluorocarbons of any type. Further, power-generating microturbines have ultra-low emissions totaling less than 9 ppm NO<sub>x</sub>. The net result is clean operation throughout the year, which can result in significant financial incentives in some states. The PureComfort™ solutions are also designed to be highly reliable, containing fewer moving parts than traditional approaches.

Clean onsite cooling, heating, and power is a concept that makes perfect sense. And with the PureComfort™ solutions, the concept can go much further – to become a fully viable, highly profitable solution. One based on experience, with all components and service coming from an integrated source. That's the advantage of UTC Power.



PureComfort™ 60 kW Microturbines

### PureComfort™ Solutions Feature:

- ▼ **High energy efficiency** – PureComfort™ solutions provide high-efficiency cooling, heating, and power which can reduce energy spending by up to \$350,000 annually for each system.
- ▼ **Reliable power** – Power is generated continuously at your location, exclusively for your building. This reduces your dependency on the grid and helps minimize power interruption – for higher year-round productivity.
- ▼ **Environmentally friendly** – PureComfort™ solutions use no ozone-depleting fluorocarbons, and they produce ultra-low emissions which can qualify your building for significant financial incentives that can reduce your initial product and installation costs by as much as 30%.
- ▼ **Pre-engineered solutions** – Several PureComfort™ solution designs give you the flexibility to choose the model best suited to your needs, without the higher costs and longer lead times of developing a fully customized system.
- ▼ **Remote monitoring** – Enables our service organization to monitor system performance 24/7, and respond quickly if there's ever a need, minimizing downtime.



PureComfort™ Absorption Chiller



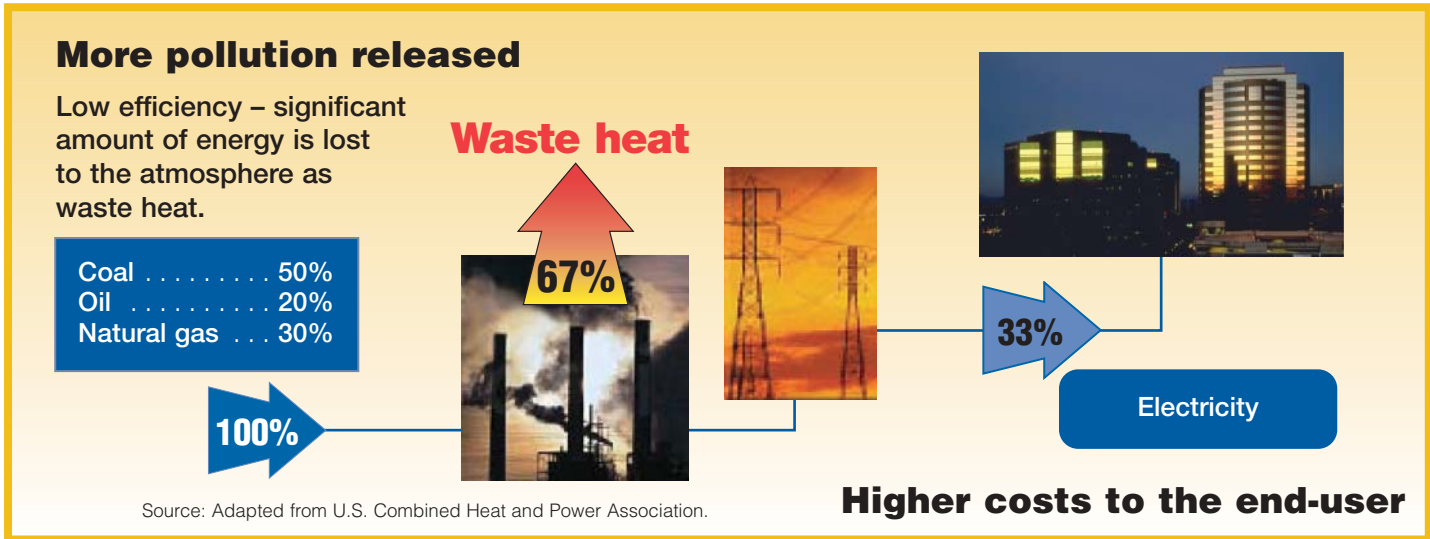
UTC Power would like to recognize our collaboration with DOE DE (Office of Distributed Energy within the Office of Energy Efficiency and Renewable Energy) in developing the technology that enables commercialization of the PureComfort™ products.

**Converting more fuel to energy – reusing exhaust heat is the key.**

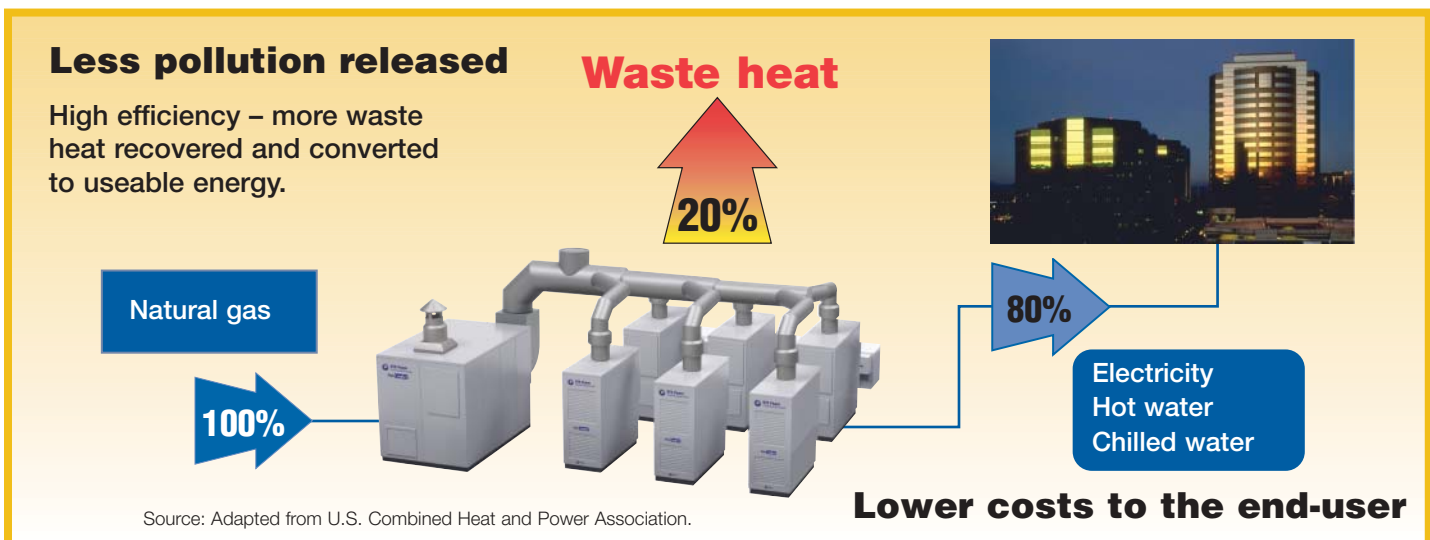
Transmitting power across great distances carries a price. By the time grid-supplied power reaches your facility, much of the fuel's original energy has been lost – a loss utilities constantly need to reclaim through their energy rates.

PureComfort™ solutions are inherently more efficient. In fact, they operate at over twice the efficiency of the grid. First, there are no transmission losses. Energy is created right where it's used – inside your building. More importantly, exhaust heat

is recaptured and used to generate additional useable energy in the form of cold and hot water, which provide cooling and heating. The conversion of fuel to useable energy is, therefore, more complete, which translates to higher efficiency. The process is cleaner, more reliable, and makes better use of natural gas fuel. This all translates to continuous savings – for you.

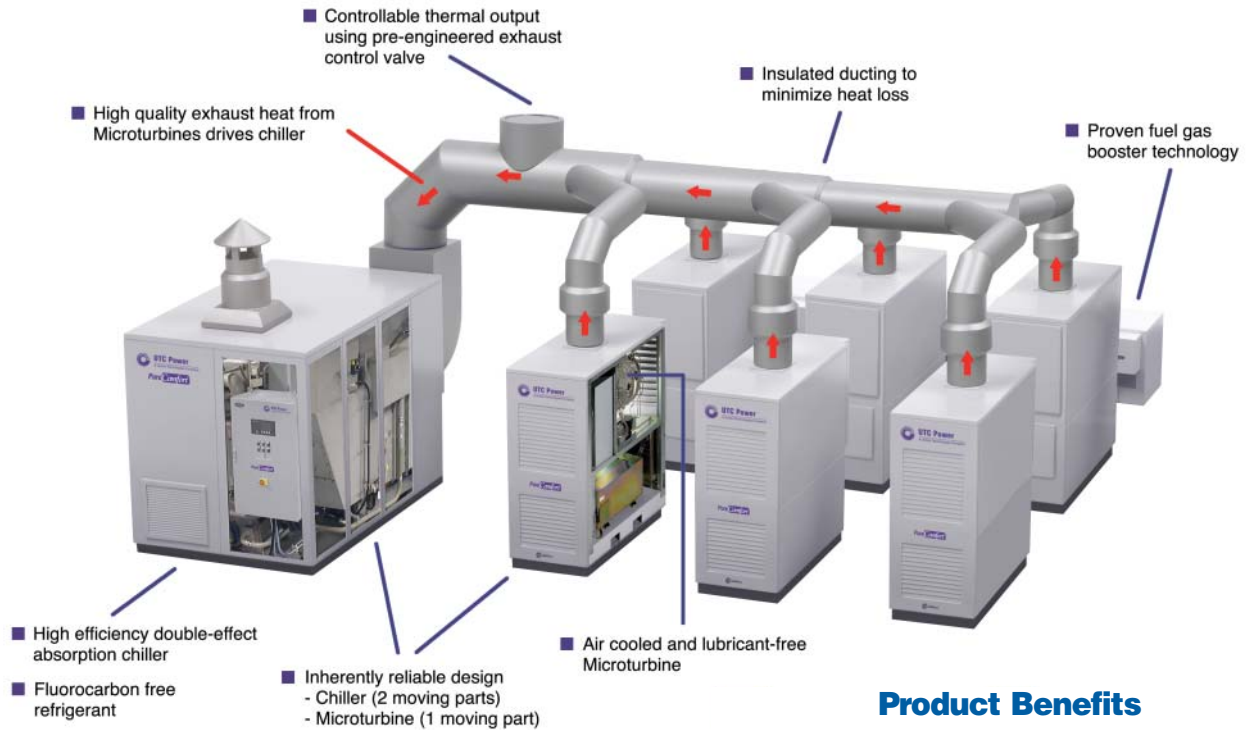


In today's centralized power generation, a plant typically releases 67% of energy from fuel as waste heat, and the remaining 33% as electricity.



By recovering and using waste heat, cogeneration systems release, on average, 20% of energy as heat to the atmosphere, while the remaining 80% is converted to electricity, steam/hot water and chilled water, depending on the system.

## Inside the PureComfort™ System



**NOTE:**  
The PureComfort™ solution pictured is the 360M- which is the 6 microturbine configuration, the solution is also offered in a 300M (5 microturbine configuration) and 240M (4 microturbine configuration).

### Product Benefits

- Low acoustic noise level vs competing technologies**
- Simplified utility connection**
- Environmentally friendly - low emissions**
- Low Maintenance**
- High efficiency**
- Seasonal heating and cooling**
- Reliability**
- Remote Monitoring**

### PureComfort™ Product Performance

Model	240M	300M	360M
<b>Hot Day (ARI, 95°F)</b>			
Net Power, kW	202	252	301
Cooling Output, RT	120	139	155
System Efficiency LHV Basis	75%	71%	68%
<b>ISO Day (59°F)</b>			
Net Power, kW	229	287	344
Cooling Output, RT	161	188	210
System Efficiency LHV Basis	91%	86%	82%
<b>Cold Day (32°F)</b>			
Net Power, kW	229	287	345
Heating Output, MBh	961	1,175	1,386
System Efficiency LHV Basis	59%	59%	58%

### PureComfort™ Physical Data

Model	240M	300M	360M
<b>Approx. System Dimensions</b>			
Length, ft	22	28	28
Width, ft	21	21	21
Height, ft	16	16	16
<b>Weights</b>			
Chiller, lbs	18,544	18,544	18,544
Each Microturbine, lbs	1,700	1,700	1,700
System Weight, lbs	28,550	30,833	32,566

### PureComfort™ Product Options

#### Microturbine

- Grid connect or dual mode
- Inlet silencer for noise reduction
- Fuel gas boosters and fuel option kits as required, based on customer gas pressure

#### Chiller/Heater

- Outdoor enclosure
- 175°F hot water option
- Evaporator pass quantity
- Absorber/Condenser flow switch
- 150 or 300 psig pressure waterbox
- Victaulic or flanged connections

#### System Level

- UTC Power standard ductwork
- No ductwork
- Skidded or non-skidded

Chiller output performance varies with installation and ambient conditions.

The manufacturer reserves the right to change or modify, without notice, the design or equipment specifications without incurring any obligation with respect to equipment either previously sold or to be sold. The manufacturer does not warranty the data on this document. Warranted specifications are documented separately.

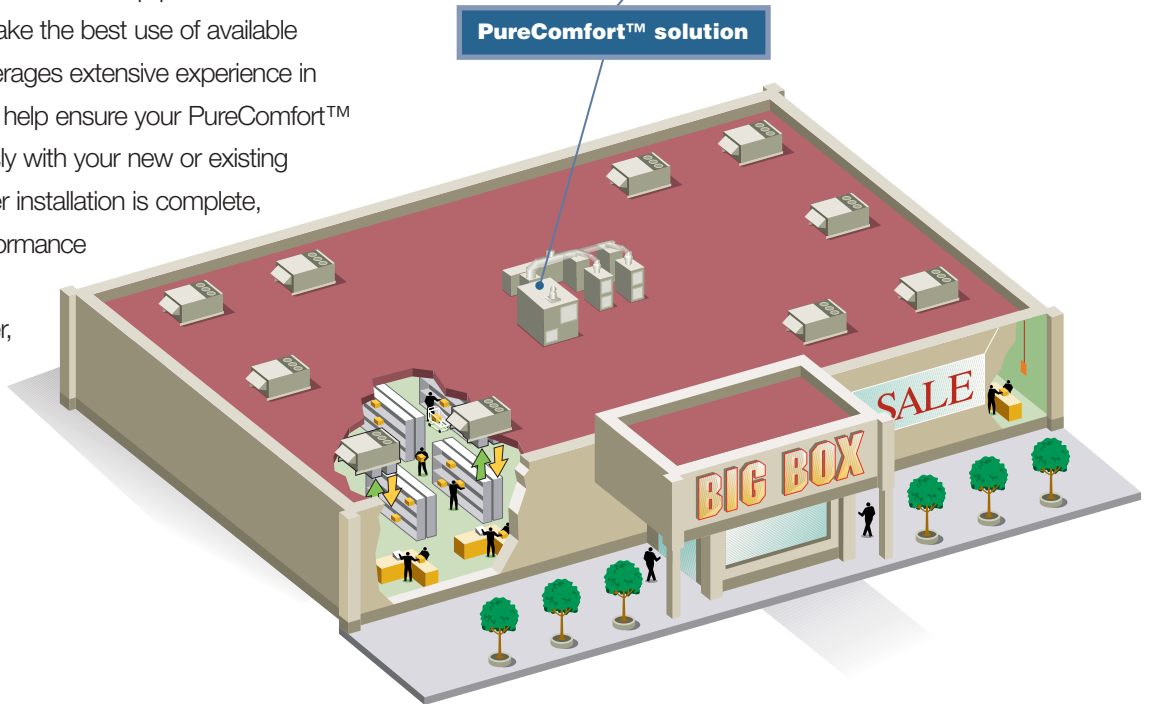
**Well suited to a variety of applications.**

PureComfort™ solutions are available in several configurations, delivering up to 360 kW of gross power with heating and cooling capacities of 1,386 MBh and 210 RT, respectively, depending on ambient temperature. This makes PureComfort™ solutions well suited to power and space conditioning applications, such as hotel, office, school, and hospital buildings, as well as supermarkets and other retail businesses which depend heavily on refrigeration.

- RETAIL
- HEALTHCARE
- HOTELS
- OFFICES
- PUBLIC BUILDINGS



To extend PureComfort™ solution versatility even further, UTC Power can configure and install systems in a variety of ways – basement, top-floor and rooftop placement of units are possible to help make the best use of available space. UTC Power also leverages extensive experience in building comfort systems to help ensure your PureComfort™ solution integrates seamlessly with your new or existing building control system. After installation is complete, we can monitor system performance remotely, 24/7, through our centralized monitoring center, in Charlotte, North Carolina, dispatching field technicians if necessary.



## How much can you save?

Several factors determine how quickly a PureComfort™ solution will pay for itself, and how much will be saved thereafter in energy costs. There are regional factors – climate and local cost of electricity, for example – as well as application variables, such as building type, whether refrigeration is required, and if so, whether a desiccant system is present. In all cases we can quickly help you determine the maximum savings available to you. And PureComfort™ solution savings are often substantial.

Payback can often be achieved in 2 to 3 years, followed by annual energy cost savings of up to \$200,000 for each system.

If you'd like to know how much you might save, a PureComfort™ solution specialist can create a detailed cost analysis based on your location and the size and type of your building.

Typical Customer Economics			
Region	PureComfort™		
	240M	300M	360M
<b>California (PG&amp;E Region)</b>			
Payback, years	1.7	1.6	1.5
Annual Savings, \$	\$240,700	\$295,300	\$345,900
<b>California (SCE Region)</b>			
Payback, years	2.6	2.5	2.4
Annual Savings, \$	\$156,300	\$190,600	\$221,700
<b>New York (ConEd Region)</b>			
Payback, years	4.1	4.1	4.1
Annual Savings, \$	\$121,500	\$146,900	\$169,200

PG&E – Pacific Gas & Electric; SCE – Southern California Edison; ConEd – Con Edison

**Assumptions:** 5000 hours of power and cooling, 3000 hours of power and heating

Energy rates as of June 2004

California Self-Generation Incentive Program (SGIP) incentives apply for PG&E and SCE regions

Cash flow; pre-tax basis



California (PG&E Region)	Annual Costs	
	Baseline	PureComfort™ 360M
<b>Equipment</b>	\$ 52,600	\$ 514,500
<b>Installation (w/cooling tower)</b>		\$ 205,000
<b>Self-Generation Incentive Program (SGIP)</b>	\$ –	\$ (145,300)
<b>Net Total</b>	\$ 52,600	\$ 574,200
<b>Net Capital</b>		\$ 521,600
<b>Payback, Years</b>		1.5
<b>Grid Electricity</b>	\$ 529,900	\$ –
<b>Natural Gas</b>	\$ 33,800	\$ 177,500
<b>Maintenance</b>	\$ –	\$ 40,300
<b>Total</b>	\$ 563,700	\$ 217,800
<b>Annual Net Savings</b>		\$ 345,900

**Model 360M PG&E Scenario:**

- 5000 hours/year cooling, 3000 hours/year heating
- Grid Electricity = \$0.14/kWh
- Baseline gas = \$6.38/MMBtu
- CHP gas = \$4.30/MMBtu

**UTC Power.**  
**Experience you can count on.**

UTC Power is a company dedicated to providing high-efficiency, low emission, reliable on-site power systems. By leveraging the resources and expertise of Carrier, a world leader in refrigeration and building comfort systems, and UTC Fuel Cells, UTC Power has become a fully integrated, single-source on-site power supplier with unsurpassed experience:

- Over 73 MW installed
- Over 8 million hours of combined fleet operation (microturbines and fuel cells)
- Turnkey systems
- Interconnection experience
- Installations in 85 cities and 19 countries

PureComfort™ solution components – microturbines and chillers – have been designed and field-tested to provide continuous operation with minimal need for service.

**Microturbines:**

- Proven technology – over 5 million operating hours
- No liquid lubricants or coolants
- Single moving part
- Low maintenance

**Chillers:**

- Proven technology – large installed fleet
- No compression system
- Inherently reliable with few moving parts
- Minimal power required for operation



**Contributing to  
LEED Certification**

The clean energy PureComfort™ solutions can be an integral part in achieving LEED Certification – the national standard in validating energy-efficient, environmentally friendly “green” building design.

Benefits can include not only lower energy costs, but also healthier indoor environments which have been shown to increase productivity. In some areas, additional financial incentives are also available for green buildings.

**Carrier Commercial Services Nationwide Network**



*Each installed PureComfort™ 240M solution produces about **40%** less CO<sub>2</sub> per megawatt-hour than the average fossil fueled utility power plant.*

Each installed PureComfort™ 240M solution also produces about 10,000 lb/year less NOx than typical fossil fueled grid power, the equivalent of taking more than 250 average passenger cars off the road.



Sources: DOE, EPA & Statistical Abstracts of the United States

United Technologies (UTC)  
is a \$31 billion corporation  
providing high-technology products  
to the aerospace and building systems  
industries throughout the world.

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